HEWLETT® PACKARD

HP PCL/PJL Reference

Printer Job Language Technical Reference Manual

Printer Job Language Technical Reference Manual

HEWLETT PACKARD

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Inside This Manual

What You Can Learn From This Manual

Printer Job Language (PJL) was developed by Hewlett-Packard to provide a method for switching printer languages at the job level, and for status readback between the printer and the host computer. PJL offers application programs an efficient way to remotely control Hewlett-Packard printers. Using PJL, developers can provide applications with the ability to programmatically switch printer languages, monitor printer status, request the printer model and configuration, change control panel default settings, modify control panel messages, and more.

This manual is written for experienced users such as application developers and technical support personnel. Before using PJL commands, programmers should be familiar with the introductory information in Chapters 1, 2, and 3, and with the programming tips in Chapter 11. In addition, users of this manual should be acquainted with the HP LaserJet printer language (PCL) and with LaserJet printer features.

Application Developers

This *PJL Technical Reference Manual* provides developers with all the information necessary to add PJL to their applications. Examples are used throughout the manual to help developers write efficient and properly functioning code.

Technical Support Personnel

This manual provides reference information for network administrators and other technical support personnel who manage multi-user systems. PJL provides the potential for significantly enhancing network printer operation.

Non-Technical Users

Non-technical users can use the features of PJL by using *HP Explorer Software*, or by using software that supports PJL. Since improperly used PJL commands can cause problems in a network situation, inexperienced users are advised against using PJL commands on any system other than a dedicated workstation.

Manual Organization

This manual is comprised of eleven chapters and four appendices. The first three chapters introduce you to the range of PJL features, PJL syntax and format, some rules about using PJL, and a brief description of each command. Chapter 4 explores the essential “kernel” commands—those commands that are part of almost every PJL job. Chapters 5 through 10 each describe a separate group of related commands. The remaining chapters cover programming tips and related PJL information. A brief description of each chapter is provided below.

Chapter 1. Introduction to PJL

This chapter explains what PJL is, who should use PJL, and the benefits of using PJL in application programs. It also covers compatibility with non-PJL printers, which includes older models of HP LaserJet printers, HP DeskJet printers, and HP DesignJet plotters and printers.

Chapter 2. PJL Command Syntax and Format

Chapter 2 explains the conventions used to describe PJL command syntax. The chapter also explains the formats that PJL commands follow and describes what happens when the printer receives an illegal command.

Chapter 3. Using PJL

This chapter explains how PJL commands are used, including the requirements of a PJL job and examples showing basic PJL command structure. In addition, the chapter categorizes the PJL commands in this manual by their functionality, along with a brief command summary.

Chapter 4. Kernel Commands

This chapter explains the three core commands used in most PJL jobs: the Universal Exit Language (UEL) command, the COMMENT command, and the ENTER command. The chapter also describes the related topics of implicit and explicit printer language switching.

Chapter 5. Job Separation Commands

Chapter 5 describes the JOB and EOJ commands, which are used in combination to define job boundaries and provide job-related feedback, such as job completion.

Chapter 6. Environment Commands

This chapter explains setting the printer to a known state. The DEFAULT, INITIALIZE, RESET, and SET commands are explained here.

Chapter 7. Status Readback Commands

Chapter 7 describes status readback, the format of status readback responses, using software tools to interpret status readback, and the commands associated with status readback (INQUIRE, DINQUIRE, ECHO, INFO, USTATUS, and USTATUSOFF). This chapter also covers the processes involved in job recovery and monitoring the printer control panel.

Chapter 8. Device Attendance Commands

Chapter 8 describes the commands used to display messages on the printer control panel: the RDYMSG, OPMSG, and STMSG commands.

Chapter 9. PJL File System Commands

Chapter 9 describes the commands used for managing a printer-based disk drive, or other printer-based mass storage. The commands include FSAPPEND, FSDIRLIST, FSINIT, FSMKDIR, FSQUERY, FSUPLOAD, FSDOWNLOAD, and FSDELETE. These commands provide the capability to initialize the mass storage, make directories, list directories, and download, upload, delete, and append files.

Chapter 10. Job Management

Chapter 10 describes the job management features found on the HP LaserJet 8100 and 8500 printers.

Chapter 11. Programming Tips for Using PJL

This chapter demonstrates how to create well-formed jobs and discusses common problems and things to watch for when using PJL commands. Samples are included to demonstrate different types of applications.

Appendix A. Product-Specific Feature Support

This chapter lists all of the PJL commands and shows which commands are supported by the different PJL printers. It also shows which environment variables are supported, and includes printer-specific information about several PJL printers.

Appendix B. PJL Command Summary

This appendix lists all of the PJL commands in alphabetical order, and shows the format of each command.

Appendix C. Programming Examples

Appendix C shows an example of a PJL job in both the generic format used in the rest of this manual, and in the C programming language. The appendix also includes a batch file that modifies the control panel display message during job processing.

Appendix D. PJL Status Codes

This appendix describes the status code information available when using status readback.

Index

This manual includes an index for easy access to PJL information.

Related Documents

The following documents provide related information about Hewlett-Packard PCL 5 printers.

PCL 5 Printer Language Technical Reference Manual

The *PCL 5 Printer Language Technical Reference Manual* provides a description of the printer command language that controls PCL 5 printers. The manual provides explanations of each PCL command, and examples demonstrating how the commands are used to control the printer. A large portion of the manual is devoted to HP-GL/2, the vector-based graphics language that is part of all PCL 5 printers.

PCL 5 Comparison Guide

This document provides printer-specific information on paper handling, internal fonts, PCL command support, and control panel information. It identifies feature differences between the PCL 5 printers, and how the printers implement the commands described in the *PCL 5 Printer Language Technical Reference Manual*.

PCL/PJL Technical Quick Reference Guide

This booklet is designed to provide quick access to the syntax of each PCL and PJL command. The commands are grouped by their function so that those familiar with PCL and/or PJL can find the syntax of a specific command without opening the manual.

Manual Conventions

This manual uses the following conventions:

- Items in *italics* indicate names of variables.
- Items in UPPERCASE letters indicate PJL command names and words you type verbatim. PJL command names referred to in text are also in uppercase.
- Items in square brackets [ ] indicate optional parameters. The brackets themselves are not typed.
- Items in brackets < > indicate a control code character (for example, <CR> for carriage return) or a special defined identifier.
- A vertical bar (|) indicates there is more than one optional parameter.

Note Throughout this manual, the term printer also includes any relevant DesignJet plotters and printers.

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A Product-Specific Feature Support

1 Introduction to PJL

What is PJL?

Hewlett-Packard's Printer Job Language (PJL) was developed to give software applications more job-level printer control, and to provide printer status information to applications. PJL provides for the special needs of networks and other multi-user systems, in addition to enabling applications to simulate control panel functions that previously could not be controlled without pressing control panel keys.

For the HP printers (HP LaserJet, HP DeskJet, and HP DesignJet) that support it, PJL allows job-level control that cannot be accomplished with PCL, PostScript, or other printer languages. To provide this control, PJL functions “above” the level of PCL and other printer languages, providing four major functions:

- Printer language switching between jobs
- Job separation
- Printer configuration
- Status readback from the printer to the host computer

Note For information about products newer than those included in this book, see the *Printer Job Language Technical Reference Addendum*, which includes product-specific information about newer products, as well as commands and variables added to PJL to support these newer products.

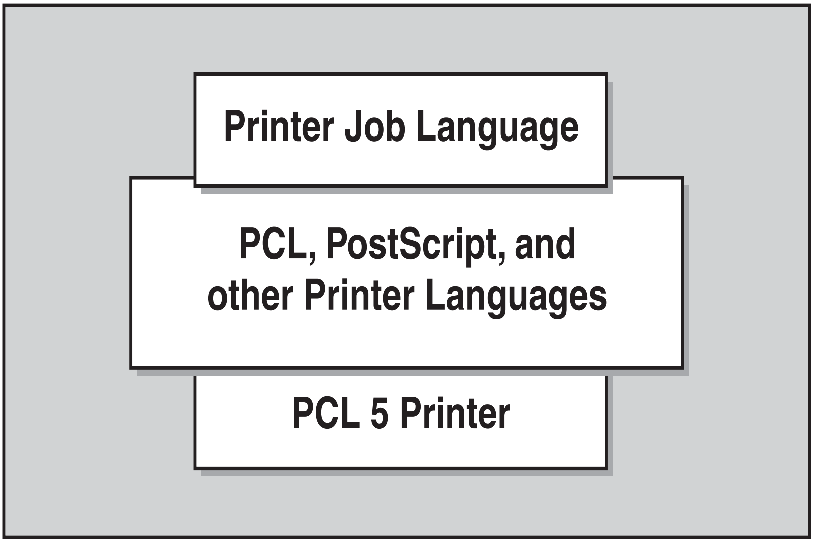


Figure 1-1 **PJL Resides Above Other Printer Languages**

Note Some HP printers, such as the LaserJet 4L, 5L, 6L, or 1100 Series printers, do not support printer language switching or job separation. See Appendix A for feature support information.

Using PJL, software applications can request information such as printer model, configuration, and status. PJL also can be used to change control panel settings and modify the message displayed on the control panel, or change feature settings in printers without a control panel, such as the HP LaserJet 1100 Series printers. For those printers supporting more than one printer language, applications can print one job using PCL, and then print the next job using PostScript or another printer language—without any operator intervention.

The Benefits of PJL

Listed below are some of the benefits PJL provides:

- **Programmatic printer language switching.** PJL provides fully reliable switching between printer languages, such as PCL, Epson, IBM ProPrinter, and PostScript, directly from within applications.
- **Printer status readback.** Printer model information, configuration, printer feature settings, and other printer status information can be obtained using PJL.
- **Programmatic front panel control.** Control panel settings, including control panel messages, can be changed remotely.
- **Ease of use.** All PJL commands except the Universal Exit Language (UEL) command consist of printable characters and plain-English words or abbreviated words. Learning to use PJL can be accomplished by reading the first three chapters of this manual and following the examples provided in the text.
- **Better spooler control.** PJL allows spoolers improved printer management, especially in a network environment.

Who Should Use PJL?

PJL is designed to be used by experienced programmers, such as software application developers and technical support personnel. Although PJL is not complicated, it is a powerful tool, and should be used only by experienced users who can create jobs that cause no adverse effects on other jobs in a shared environment. Applications containing PJL commands used as described in this manual provide users with smooth transitions between print jobs. Conversely, improperly used PJL commands can create problems in multi-user printing environments.

Compatibility With Non-PJL Printers

Because all HP printers do not support PJL, it is important to know what happens when PJL commands are sent to a non-PJL printer.

PJL commands are recognized by the following HP printers:

- LaserJet IIISi, 4Si, 4SiMx, 5Si, 5SiMx, 5Si Mopier
- LaserJet 1100 Series, 2100 Series
- LaserJet 4000 Series, 5000 Series
- LaserJet 8000 Series, 8100 Series
- LaserJet 4V, 4MV
- LaserJet 4, 4 Plus, 4M, 4M Plus, 5, 5M
- LaserJet 4L, 4ML, 4LJ Pro, 4LC, 5L, 6L
- LaserJet 4P, 4MP, 4PJ, 5P, 6P, 6MP
- Color LaserJet, Color LaserJet 5, 5M
- Color LaserJet 4500 Series, 8500 Series
- DeskJet 1200C, 1600C
- DesignJet Family
- PaintJet XL300

The printers listed above are designed to handle any PJL command, even those not supported by that particular printer. On the other hand, all PCL 4 printers, and all PCL 5 printers not listed above, do not support PJL. When PJL commands are sent to a non-PJL printer, the results differ depending on which commands are used and which printer language is used. The following paragraphs explain what happens when PCL and PostScript jobs containing PJL commands are sent to non-PJL printers.

Note For best results, do not send PJL commands to a non-PJL printer.

PCL Jobs

When non-PJL printers receive PCL jobs, any PJL commands that precede the initial PCL printer reset command (<ESC>E) print as ASCII text. When the initial printer reset command is received, it causes a page eject and the PCL job begins on a new page. The end result is a page or more of PJL commands followed by the PCL job, and possibly followed by more PJL commands. The PCL job should print as it would without any PJL commands, as long as the PCL portion of the job begins and ends with a PCL printer reset command. However, a page of PJL commands printed before and probably after the PCL job can be expected.

For those PCL applications that do not begin with a PCL printer reset command (or another PCL command that forces a page eject when preceded by printable data), the PJL commands are printed as ASCII text on the same page as the PCL job. A good portion of the job may be unusable due to unpredictable page breaks and overprinted text on the first page.

PostScript Jobs

When non-PJL printers are running in PostScript mode, PJL commands cause a PostScript error and prevent the job from printing. Pressing the printer's Continue key removes the error message, but the error causes the printer to discard the PostScript job.

Other Printer Languages

PJL code is interpreted differently when running different printer languages on non-PJL printers. To avoid printing problems, do not use PJL commands when printing to any non-PJL printer, regardless of which printer language is used.

2 PJL Command Syntax and Format

Introduction

This chapter explains the conventions used to describe PJL command syntax. This chapter also describes the several different formats that PJL commands may take, giving examples of each. The chapter provides an explanation of how PJL-compatible printers handle illegal commands.

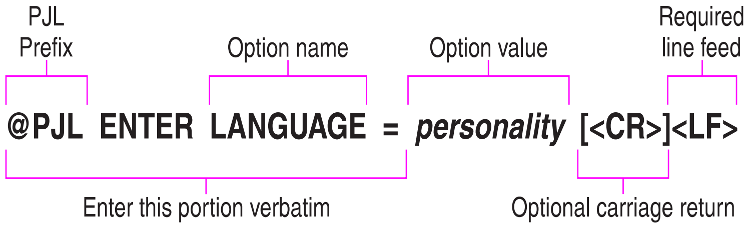
Note For information about products newer than those included in this book, see the *Printer Job Language Technical Reference Addendum*, which includes product-specific information about newer products, as well as commands and variables added to PJL to support these newer products.

Syntax Conventions

The following syntax conventions are used to describe the PJL commands in this manual:

variables	Items in italics indicate names of variables.
COMMANDS	Items in uppercase letters indicate PJL command names and words that you type verbatim. PJL command names referred to in text are also in uppercase.
[ ]	Items in brackets [. . .] indicate optional parameters. The brackets themselves are not typed.
< >	Identifies a control code character, such as <CR> for carriage return, or a special defined identifier. The table on the next page lists the control codes and special identifiers used in the PJL syntax. (The < and > symbols themselves are not typed, but are replaced with the control codes or special identifiers they represent. For example, replace <FF> with the form feed character [ASCII 12].)
↩	This character indicates that the current line of code is a continuation of the previous line. For example, “All of this text belongs on the ↩ same line.”
|	A vertical bar indicates there is more than one optional parameter, such as LPARM and IPARM: [LPARM : *personality* | IPARM : *port*].

The following illustration is an example of a PJL command line containing the ENTER command:



The table below lists the control codes and special identifiers used in this manual:

<HT>	Horizontal tab character (ASCII 9).
<LF>	Line feed character (ASCII 10).
<CR>	Carriage return character (ASCII 13).
<SP>	Space character (ASCII 32).
<ESC>	Escape character (ASCII 27).
<FF>	Form feed character (ASCII 12).
<WS>	White space, a result of one or more <SP> or <HT>.
<words>	Printable characters (Roman-8 characters 33 through 255) and <WS>, starting with a printable character.
^D	PostScript end-of-file indication. It is not part of PJL, but is used to end PostScript examples.

Format of PJL Commands

All PJL command lines follow one of the following four formats. Each format defines how commands using that format are structured.

Format #1

```
<ESC>%–12345X
```

The only command that uses this format is the Universal Exit Language (UEL) command.

Format #2

```
@PJL [<CR>]<LF>
```

This format allows a PJL line with no command, and is used to add clarity to PJL command listings. You can use one or more of these commands to visually break up several lines of PJL commands.

Format #3

```
@PJL command [<words>] [<CR>]<LF>
```

The COMMENT and ECHO commands currently are the only PJL commands using format number 3.

Format #4

```
@PJL command [command modifier : value]
↩ [option name [= value]] [<CR>]<LF>
```

This format is used for all of the other PJL commands and is described in more detail below.

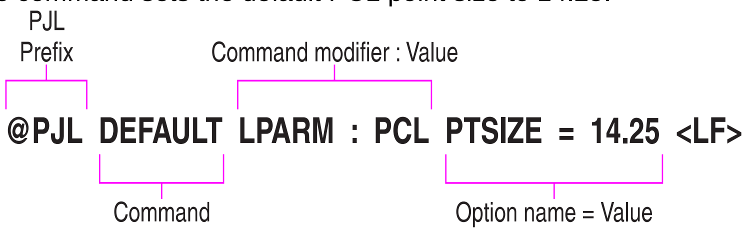
command — command is one of the assigned PJL command names, such as ENTER, RDYMSG, or RESET.

[command modifier : value] — The command modifier enables the user to specify what is effected by the command. For example, with the command modifier LPARM you can specify language-specific variables. A PJL command with a command modifier of LPARM : PCL only affects PCL-specific settings. A PJL command can contain only one command modifier. For example, in the command: @PJL SET

[LPARM : *personality*]|[IPARM : *port*] *variable* = *value* [<CR>] <LF>, you can use either the LPARM command modifier or the IPARM command modifier, but not both.

[*option name* [= ***value*]]** — The option parameter specifies an option or sets a command option to a certain value. Examples include "@PJL INQUIRE COPIES" and "@PJL ENTER LANGUAGE = *personality*." The range of values varies with each specific command and each printer model. A PJL command may have no options, or one or more options (an unlimited number).

The DEFAULT command shown below illustrates format number 4. The command sets the default PCL point size to 14.25.



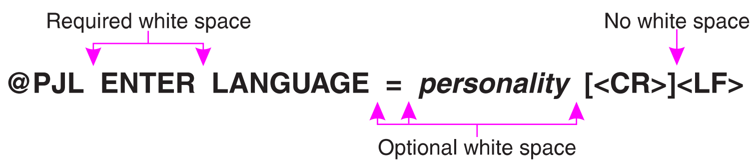
PJL Syntax Rules

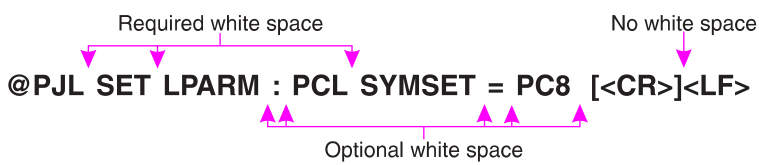
Following are the rules governing the use of PJL commands:

- The PJL prefix "@PJL" always must be uppercase. The remainder of the PJL command is not case-sensitive. For clarity, however, this manual shows other portions of PJL commands in uppercase to indicate portions that are not variable and that should be typed as shown (such as the first three words in the following command):
  @PJL STMSG DISPLAY = "*message*" [<CR>]<LF>
- Spacing between characters, or "white space," is comprised of one or more of either the space character (ASCII 32) or the horizontal tab character (ASCII 9). For clarity and consistency, this manual shows all white space as one blank space.

- The placement of white space in PJL commands depends on its location within the command. Some white space is required and some is optional:
- White space is required between the @PJL prefix and the PJL command name, and between the PJL command name and command modifiers. For example:
  `@PJL OPMSG DISPLAY` or
  `@PJL ENTER LANGUAGE =` *`personality`*
- If white space is shown in any other place in the command, it is optional (see the examples below).
- If white space is not shown between two portions of a command, white space is not allowed. An example is between the optional carriage return and required line feed character that terminate most commands.

For clarity, this manual consistently shows white space as one blank space. The PJL language requirements are shown in both examples below:





Types of Variables

PJL uses alphanumeric variables, numeric variables, and strings. The following explains the three types of variables and their ranges.

- **Alphanumeric variables.** Any combination of letters and digits, with the stipulation that the first character always must be a letter. Letters consist of the uppercase letters (Roman-8 characters 65 through 90) and lowercase letters (97 through 122). Digits consist of numbers 0 through 9 (characters 48 through 57).

  Examples of valid alphanumeric variables include:
  LaserJet279
  J1953

  Examples of invalid alphanumeric variables include:
  279LaserJet
  (Alphanumeric variables must begin with a letter)

  J 1953
  (Space characters [ASCII 32] are not allowed in alphanumeric variables)

- **Numeric variables.** Any number consisting of digits, with one optional decimal point and an optional + or – sign preceding the first digit. Only one decimal point may be used, and it must be placed somewhere after the first digit. Digits are not required after the decimal point.

  Examples of valid numeric variables include:
  0.123456
  –123.456
  +657000
  2468.

  Examples of invalid numeric variables include:
  .123456
  (The decimal point must be preceded by at least 1 digit)

  –123.45.6
  (Only 1 decimal point is allowed in a numeric variable)

  +657,000
  (Commas are not allowed in numeric variables)

- **Strings.** Enclosed in quotation marks, strings consist of any combination of characters from Roman-8 character 32 through 255, plus character 9 (horizontal tab), excluding character 34 (quotation marks).

  Examples of valid strings include:

  `"<HT>This is a valid string."`
  (Tabs are allowed in strings)

  `"Print job #4655"`

  Examples of invalid strings include:
  `"This is not a valid" string."`
  (Strings cannot contain quotation marks)

  `"This is also not<CR>valid."`
  (<CR> is not within the valid range of characters for a string.)

Note Strings displayed on the printer control panel are generally displayed using the Roman-8 symbol set. On HP LaserJet 4PJ, 4V, and 4MV printers, when the language is set to Japanese, strings which correspond to a control panel message are displayed on the control panel using the JIS X0201-76 character set.

This is also true for some other printers/languages. See the note on page 8-3.

Processing Invalid Commands

There are two general types of invalid commands: those commands with syntax errors, and those that have syntax or semantic warnings. Each type is handled differently.

- Syntax errors cause the printer to ignore the entire PJL command, and include errors such as unrecognized commands and command modifiers, strings missing closing double-quotes, numeric values missing digits before the decimal point, and numeric values encountered when alphanumeric values are expected. When the printer receives commands with syntax errors, it ignores the entire command.

  For example, the value portion of the JOB command's NAME option is a string and requires double quotes around the value (as shown below). In the second example below, the JOB command is ignored since the string (April Paychecks) contains the opening but not the required closing quotes.

  Valid command:
  ```
  @PJL JOB NAME = "April Paychecks" <LF>
  ```

  Invalid command:
  ```
  @PJL JOB NAME = "April Paychecks <LF>
  ```

- Syntax warnings and semantic warnings are issued for commands such as those having unsupported options, values that are out of range, values that are the wrong type or missing, or values that are included when none are allowed. When the printer receives commands with syntax or semantic warnings, it executes as much of the command as possible, but the portion of the command containing the warning is ignored.
- For example, in the following two sample PJL commands, START is a valid option for the JOB command, but FINISH is not a valid option (the END option should be used). The START option is executed, but the FINISH option is ignored.

  Valid command:
  ```
  @PJL JOB START = 1 <LF>
  ```

  Invalid command:
  ```
  @PJL JOB START = 1 FINISH = HOME <LF>
  ```

Note

Any errors that occur during PJL parsing can be received by enabling device status as described in Chapter 7 (send the @PJL USTATUS DEVICE = VERBOSE command). Appendix D lists the status codes that are received by the host when an invalid command is received and unsolicited verbose device status is enabled.

3 Using PJL

Introduction

This chapter describes how PJL commands are used. After reading this chapter, you can create basic jobs and perform simple PJL tasks, such as printer language switching and changing some PJL feature settings.

To give you an understanding of where to look for more PJL information, this chapter explains how the manual categorizes PJL commands into groups of related commands. Each command has a brief description of its function to help familiarize you with the PJL language.

Note Each PJL printer supports a different set of PJL commands. See Appendix A for printer-specific information.

Note For information about products newer than those included in this book, see the *Printer Job Language Technical Reference Addendum*, which includes product-specific information about newer products, as well as commands and variables added to PJL to support these newer products.

Overview of How Commands are Used

As previously explained, PJL resides “above” other printer languages such as PCL and PostScript. PJL commands encapsulate the printer language jobs, as shown in Figure 3-1. The Universal Exit Language (UEL) command allows the printer to alternate between interpreting PJL commands and printer language commands. (Although PCL and PostScript are shown in Figure 3-1, other printer languages can be involved.)

PJL Code	PCL Job	PJL Code	PostScript Job	PJL Code

Figure 3-1 PJL Commands Encapsulate Print Jobs

PJL Job Requirements

PJL has certain job requirements that must be met to work correctly. Jobs that satisfy the following requirements are “well-formed” and work well with all PJL printers, both in single-computer/single-printer environments and network environments. Here are the requirements:

- All PJL jobs must begin and end with a UEL command (`<ESC>%–12345X`). This command exits the current printer language and returns control to PJL.
- The UEL command at the beginning of the job must be immediately followed by the PJL command prefix (@PJL). The “@PJL” can be followed by an optional carriage return and a required line feed character, or it can be the prefix of another PJL command (see the two following examples). No other characters, including control characters, are allowed between the UEL command and the @PJL prefix.
- The UEL command at the job end must not be followed by anything (except the first character of the next job).
- Line Termination—a line feed character (<LF>) is required to terminate all PJL commands (except the UEL command). A carriage return can precede the terminating line feed, however the carriage return is optional and is ignored.
- No blank command lines are allowed. The command `@PJL [<CR>]<LF>` is provided for situations where a blank line is needed to add space between command lines.

The following command lines demonstrate two ways to begin a job while satisfying PJL requirements. Both lines begin with a UEL command, are immediately followed by @PJL, and are terminated with a line feed character. All PJL jobs also must end with a UEL command. The examples on the following page demonstrate how to begin and end a PJL job.

```
<ESC>%–12345X@PJL <CR><LF>
<ESC>%–12345X@PJL COMMENT *Start Job* <CR><LF>
```

Some Sample PJL Jobs

This section consists of two basic PJL jobs that illustrate how to use PJL. The first job changes a few printer control panel settings and prints a PCL file. The second job prints a PCL file followed by a PostScript file. (The ↩ symbol indicates that the command line is actually part of the previous line.)

Example: Changing Control Panel Settings

This example simulates using PJL to control printer features that are not available in a particular application program. In this case, the features to be modified are the number of copies and the Resolution Enhancement technology setting.

```
<ESC>%–12345X@PJL COMMENT *Start Job* <CR><LF>
@PJL JOB NAME = "Sample Job #1" <CR><LF>
@PJL SET COPIES = 3 <CR><LF>
@PJL SET RET = OFF <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E. . . . PCL job . . . .<ESC>E
↩<ESC>%–12345X@PJL <CR><LF>
@PJL EOJ<CR><LF>
<ESC>%–12345X
```

Example: Switching Printer Languages

This example contains two print jobs, one PCL and one PostScript. The PCL job prints first, then PJL code switches the printer language to prepare for the PostScript job.

```
<ESC>%–12345X@PJL <CR><LF>
@PJL COMMENT ** Beginning PCL Job ** <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
@PJL SET LPARM : PCL SYMSET = DESKTOP <CR><LF>
<ESC>E . . . . PCL job . . . .<ESC>E
↩<ESC>%–12345X@PJL COMMENT End PCL <CR><LF>
@PJL COMMENT Ready for PostScript Job <CR><LF>
@PJL ENTER LANGUAGE = POSTSCRIPT <CR><LF>
%!PS-ADOBE ... PostScript print job ... ^D
↩<ESC>%–12345X
```

What's Next?

Now that you have learned the PJL requirements and have seen how to use PJL commands in the sample programs described on the previous page, look through the following “Command Groupings” table. It can help you find the information you need to add PJL capabilities to your application. If your application only uses PJL to switch printer languages, you may need to read only Chapter 4. However, if you want to do more with PJL, be sure to look through Chapter 11 (Programming Tips for Using PJL), and the other chapters that pertain to your application. Also, be sure you know which PJL commands are supported by the printer you are using. See Appendix A for feature support information.

- Chapter 5 explains commands that enable you to create jobs for keeping track of printing status, and explain a non-printing mode that allows printing of specific pages of print jobs.
- Chapter 6 describes commands that enable you to change control panel settings and default configuration settings. The commands in this chapter enable you to set the printer features to a known state.
- Chapter 7 covers status readback commands, enabling you to request configuration and status information from the printer.
- Chapter 8 explains the commands that can alter the messages displayed on the printer control panel.
- Chapter 9 describes the PJL file system for managing printer-based file storage.
- Chapter 10 describes using the PJL job management commands.

Command Groupings by Functionality

This manual categorizes the PJL commands into related groups. Each group of commands is covered in a separate chapter, as indicated in the following table. This table lists each command and gives a short description of each.

Command Group	Command	Command Description
Kernel Commands (Chapter 4)	Universal Exit Language (UEL)	Exits current printer language and returns control to PJL.
	COMMENT	Causes PJL to accept the command line as a comment.
	ENTER	Selects a printer language for processing the current job.
Job Separation Commands (Chapter 5)	JOB	Informs printer of the start of a print job, resets the page count, allows naming of the job, supports non-printing mode for printing portions of jobs. Where supported, it adds PJL password security.
	EOJ	Tells printer the print job is complete, resets the page count.
Environment Commands (Chapter 6)	DEFAULT	Sets default value for environment variables.
	SET	Sets an environment variable to a specified value for the duration of a PJL job.
	INITIALIZE	Resets current and default PJL variables to factory default values.
	RESET	Resets current PJL variables to default values.

Command Group	Command	Command Description
Status Readback Commands (Chapter 7)	INQUIRE	Requests the current value for a specified environment variable.
	DINQUIRE	Requests the default value for a specified environment variable.
	ECHO	Returns the <words> portion of the command to the host computer.
	INFO	Requests a specified category of printer information, such as printer model number, printer memory available, configuration, page count, status, environment variables, and unsolicited status variables.
	USTATUS	Allows printer to send unsolicited status messages for device status changes, end-of-job status, and pages printed. Status can be sent at specified time intervals.
	USTATUSOFF	Turns off all unsolicited status.

Command Group	Command	Command Description
Device Attendance Commands (Chapter 8)	RDYMSG	Specifies a message that replaces the READY message on the printer control panel. Does not affect online state.
	OPMSG	Displays specified message on printer control panel and takes printer offline.
	STMSG	Displays specified message on printer control panel and takes printer offline. If status readback is enabled, returns name of the key (ON LINE, CONTINUE, or RESET) that operator presses to return the printer online.
PJL File System Commands (Chapter 9)	FSAPPEND	Appends data to an existing file or creates a new file.
	FSDELETE	Deletes printer mass storage files.
	FSDIRLIST	Lists PJL file system files and directories.
	FSDOWNLOAD	Downloads files to the printer mass storage system.
	FSINIT	Initializes the printer mass storage file system.
	FSMKDIR	Creates a directory on the printer mass storage file system.
	FSQUERY	Queries existence of directories and files and returns file sizes.
	FSUPLOAD	Uploads all or part of a file from the printer to the host.

4 Kernel Commands

Introduction

This chapter explains the following three PJL commands:

- Universal Exit Language (UEL) command — exits the current printer language and returns control to PJL.
- ENTER command — selects a printer language for processing the current job.
- COMMENT command — enables developers to add comments to their PJL commands.

Together, these commands provide a minimum set of tools necessary to implement job control. These commands allow applications to set job boundaries, add comments, and programmatically select printer languages.

Besides programmatic printer language switching, you can configure some LaserJet printers to switch printer languages automatically between print jobs. Following the descriptions of the UEL, ENTER, and COMMENT commands, this chapter describes the different methods used to switch printer languages.

Note For information about products newer than those included in this book, see the *Printer Job Language Technical Reference Addendum*, which includes product-specific information about newer products, as well as commands and variables added to PJL to support these newer products.

Universal Exit Language (UEL) Command

The Universal Exit Language (UEL) Command causes the printer to exit the active printer language. The printer then returns control to PJL.

Note Use the UEL command at the beginning and end of every PJL job. You do not need a UEL command before every PJL command. The examples demonstrate using this command.

Syntax:

```
<ESC>%-12345X
```

Parameters:

The UEL command does not use any parameters.

Comments:

The UEL command is a data stream sequence recognized by all printer languages in PJL printers. The UEL command instructs the active printer language to finish processing the current job and relinquishes control to PJL. If PJL is active, any unprocessed PJL commands are discarded and the printer is ready to accept the next PJL command.

Note If the printer is processing a PostScript job and TBCP is enabled, the UEL command causes the printer to exit PostScript and enable PJL.

Remember that:

- All jobs must start and end with the UEL command. Printers that support I/O switching use the UEL command as one way to determine job boundaries, indicating when to perform I/O switching (see the "Timeouts" section in Appendix A).
- At the beginning of a PJL job, the PJL command prefix (@PJL) must immediately follow the UEL command. If the printer receives any characters, spaces, or control codes before @PJL, it enables the default printer language and processes the job in that printer language (if `PERSONALITY =AUTO`, the data stream is sampled for context-sensitive switching—see

the “Methods of Printer Language Switching” later in this chapter). Instead of relying on implicit switching, use the ENTER command to specify the printer language, even if the printer has only one printer language.

The following example demonstrates the use of the UEL command.

Example: Using the UEL Command

This example enters PCL and prints a PCL job. Notice how the job begins and ends with the UEL command, and how the first UEL command is followed immediately by the @PJL prefix.

```
<ESC>%-12345X@PJL COMMENT PCL Job <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E . . . . PCL Job . . . . <ESC>E
⮐<ESC>%-12345X
```

If the print job was a PostScript job instead, the following would be sent:

```
<ESC>%-12345X@PJL COMMENT PostScript <CR><LF>
@PJL ENTER LANGUAGE = POSTSCRIPT <CR><LF>
%!PS-ADOBE ... PostScript print job ... ^D
⮐<ESC>%-12345X
```

Similarly, for an ESC/P print job, send the following:

```
<ESC>%-12345X@PJL COMMENT ESC/P <CR><LF>
@PJL ENTER LANGUAGE = ESCP <CR><LF>
 ... ESC/P print job ...
⮐<ESC>%-12345X
```

ENTER Command

The ENTER command enables the specified personality (such as PCL or PostScript). Use this command to select the printer language for printing subsequent data.

Syntax:

```
@PJL ENTER LANGUAGE = personality [<CR>]<LF>
```

Parameters:

Parameter	Range
personality	PCL, POSTSCRIPT, ESCP, Others *
* Other personalities might be supported.	

- ***personality*** — The personality variable must be set to PCL, POSTSCRIPT, ESCP, or one of the other supported personalities. Personalities besides PCL and PostScript can be added to some printers by plugging in additional hardware, such as cartridges or ROM SIMMs. If your application handles status readback, you can request a list of all valid personalities present in the printer (see the “INFO CONFIG” section in Chapter 7).

Comments:

The ENTER command must be positioned immediately before any personality-specific data. The selected personality begins parsing immediately after the <LF> that terminates the ENTER command.

If the printer does not receive the ENTER command requesting a specific printer language, the printer enables the default printer language as set from the control panel (or if the printer supports context switching, such as the HP Color LaserJet 4500 series, 8500 series, 8100 series, LaserJet 2100 series, 4000 series, 5000 series, 8000 series, 8100 series, 5Si, 5SiMX, 5Si Mopier, 5, 5M, 5P, 6P, and 6MP printers, it samples the data stream if *personality* is set to AUTO—see the “Methods of Printer Language Switching” later in this chapter).

Note To select the ESC/P personality, always be sure to use the @PJL ENTER LANGUAGE = ESCP command to explicitly select it.

For any job containing personality-specific data, send the ENTER command if the intended printer language is known, instead of relying on the printer's ability to switch to the default printer language. This is true even if there is only one available personality.

When a printer language is specified, that language currently must be installed in the printer. If the printer receives a request for an invalid printer language, the printer consumes the data stream until it finds the next UEL command, and then discards the data. The printer also posts an “invalid personality” clearable warning message (W2 INVALID PERS) and, if enabled, returns a status message.

Note In spooling applications, performance is not adversely affected if both the application file and the spooler send the ENTER command.

Example: Using the ENTER Command

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Beginning PostScript Job <CR><LF>
@PJL ENTER LANGUAGE = POSTSCRIPT <CR><LF>
%!PS-ADOBE ... PostScript print job ... ^D
⏎<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT End of PostScript Job <CR><LF>
@PJL <CR><LF>
@PJL <CR><LF>
@PJL COMMENT Prepare for PCL Job <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E . . . . PCL Job . . . . <ESC>E
⏎<ESC>%-12345X
```

COMMENT Command

The COMMENT command enables you to add a line of information as a comment. Use this command whenever you want to add an explanation to PJL commands.

Syntax:

```
@PJL COMMENT remarks [<CR>]<LF>
```

Parameters:

Parameter	Range
remarks	Roman-8 character codes 33 through 255 and <WS>, starting with a printable character.

Comments:

The COMMENT command is useful for documenting lines of PJL commands. Comments may be placed anywhere in the PJL code between the initial UEL command and the ENTER command. (Comments placed after the ENTER command are considered personality-specific data and are printed as determined by the active printer language.)

Like other PJL commands, the COMMENT command is terminated by a line feed character. You cannot extend comments onto the next line. Comments longer than one line require a separate COMMENT command for each line.

See the following page for an example demonstrating the use of the COMMENT command.

Example: Using the COMMENT Command

This example demonstrates using the COMMENT command to add clarity to your PJL command listings.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT ************************ <CR><LF>
@PJL COMMENT ** D. Thiel— 10/22/92 ** <CR><LF>
@PJL COMMENT ************************ <CR><LF>
@PJL <CR><LF>
```

```
@PJL <CR><LF>
@PJL JOB NAME = "Using Comments" <CR><LF>
@PJL <CR><LF>
@PJL <CR><LF>
@PJL COMMENT ****   TURNING OFF   **** <CR><LF>
@PJL COMMENT ****   RESOLUTION    **** <CR><LF>
@PJL COMMENT ****   ENHANCEMENT   **** <CR><LF>
@PJL SET RET = OFF <CR><LF>
@PJL <CR><LF>
@PJL COMMENT ***** ENTERING PCL ***** <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E . . . . PCL Job . . . . <ESC>E
↩<ESC>%-12345X@PJL <CR><LF>
@PJL EOJ <CR><LF>
<ESC>%-12345X
```

Methods of Printer Language Switching

There are three methods of switching printer languages, two of which are supported by all PJL printers. All three methods are described below:

- **Explicit Switching.** With explicit switching, the ENTER LANGUAGE command is used to “explicitly” select the desired printer language. This is the preferred switching method because it ensures that the specified printer language is always selected (see Figure 4-1).
- **Implicit Switching.** If the printer has a default printer language configured, and the print job does not explicitly select a printer language using the ENTER LANGUAGE command, the printer automatically switches to the default printer language. (See the User's Manual for each printer for instructions about specifying a default printer language.) This switching method does not always ensure that the proper printer language is used, since the printer simply uses the default language.
- **Context Switching** (HP Color LaserJet 4500 series, 8500 series, 8100 series, LaserJet 2100 series, 4000 series, 5000 series, 8000 series, 8100 series, HP Color LaserJet, LaserJet 4, 4M, 4 Plus, 4M Plus, 4Si, 4SiMx, 4000 series, 5Si, 5SiMx, 5Si Mopier, 4ML, 4P, 4MP, 4V, 4MV, 5P, 6P, 6MP, DesignJet plotters and printers only). If the printer is set to automatically select a printer language (see the printer user's manual), and the print job does not explicitly select a printer language using the ENTER LANGUAGE command, the printer samples the incoming data and looks for indications of a

particular printer language. Once it recognizes the printer language, the printer backs up to the beginning of the sampled print data and switches to the printer language determined to be most appropriate. Then it begins to parse the data in the newly selected printer language.

Note HP LaserJet 4V and 4MV printers cannot properly context-switch into the ESC/P personality by sensing the data stream. Developers who use ESC/P must use explicit or implicit switching.

Although printers supporting context switching can select printer languages accurately, we recommend that every job containing printable data include an ENTER LANGUAGE command to explicitly select the correct printer language. This method improves performance and eliminates unintentional printer language switching, which can potentially cause data loss. Performance is not adversely affected if both the application and the spooler send the ENTER LANGUAGE command.

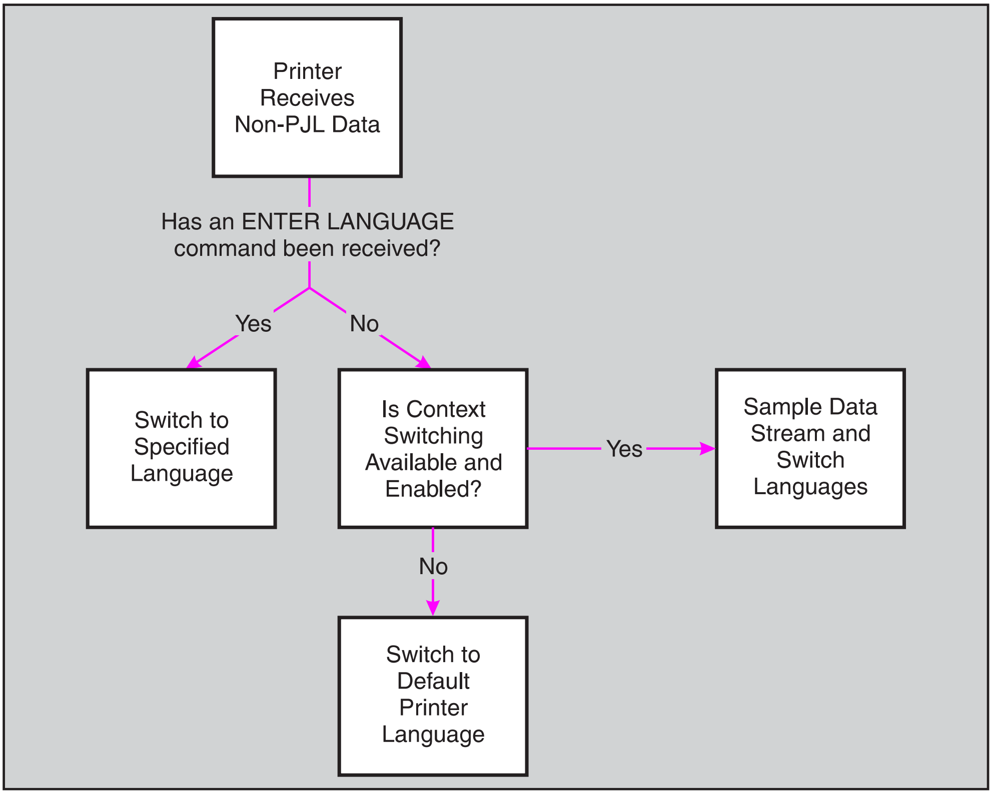


Figure 4-1 Switching Printer Languages

5 Job Separation Commands

Introduction

This chapter explains the JOB and EOJ commands. These commands are used to describe the boundaries of a job, indicating where the PJL job begins and ends. The commands can be used to name a job, and they support a non-printing mode for printing selected pages within a job. When used in combination with status readback, the printer also can send status information regarding when the printer starts processing the job and when the job is complete. This chapter also describes PJL security and job cancellation and their relationship to the JOB command.

Note For information about products newer than those included in this book, see the *Printer Job Language Technical Reference Addendum*, which includes product-specific information about newer products, as well as commands and variables added to PJL to support these newer products.

JOB Command

The JOB command informs the printer of the start of a PJL job and synchronizes the job and page status information. It also is used to specify which pages of a job are printed. Use the JOB/EOJ commands for spooling and related applications to monitor printing status, name a job, print portions of a job, or to mark job boundaries to keep the printer from treating a single print job as multiple jobs (for example, when printing a job with a banner page). Also, in jobs sent to those printers supporting the PASSWORD option, use a JOB command to specify the correct password. For printers that support the DISPLAY variable, the JOB command can be used to display a control panel message while printing the job.

Note The JOB and EOJ commands always are used in pairs. Do not use one without the other.

Since the JOB command causes a reset condition, any SET commands must be positioned after the JOB command.

Syntax:

```
@PJL JOB [NAME = "job name"][START=first page]
↵[END = last page][PASSWORD = number ]
↵[DISPLAY = "display text"][<CR>]<LF>
```

Parameters:

Parameter	Functional Range	Default
NAME = "*job name*"	Roman-8 characters 33 thru 255, <SP>, <HT>	N/A
START = *first page*	1 to 2,147,483,647	1
END = *last page*	1 to 2,147,483,647	Entire job
PASSWORD = *number*	0 to 65,535	0
DISPLAY="*display text*"	Roman-8 characters 33 thru 255, <SP>, <HT>	N/A

- **NAME = "*job name*"** — The command option NAME tags the print job with a job name. The variable *job name* can be any combination of printable characters and spaces or horizontal tab characters, with a maximum of 80 significant characters. The *job name* variable is a string and must be enclosed in double quotes, as shown in the command syntax. If the NAME option is included, the unsolicited job status includes the job name (if unsolicited job status is enabled).
- **START = *first page*** — The command option START is used to provide a non-printing mode for skipping to a selected portion of the job. It indicates the first page that is printed. If the START option is omitted, the printer starts printing at the beginning of the job. If the end of the job comes before the START page, no pages are printed.

Note For duplex jobs, the front and/or back side of the page is also printed, depending on the value of START/END. If START is an even number, the front side of that page will also be printed. If END is an odd value, the backside of that page will also be printed. This allows the selected pages to be inserted back into the original duplex job.

- **END = *last page*** — The command option END indicates the page number of the last page to be printed. The *last page* variable is relative to page 1 of the print job. If the END variable is omitted, the printer prints to the end of the job. If the end of the job is encountered before the START page, no pages are printed. If the end of job is encountered before the END page, printing terminates. Additionally, if the START page is greater than the END page, no pages are printed.
- **PASSWORD = *number*** — The command option PASSWORD allows the application to modify the NVRAM variables if the password matches the active password variable. (Using PJL, the NVRAM variables are modified using either the DEFAULT or INITIALIZE commands; some printer language commands may also modify NVRAM variables.) Passwords are set using the DEFAULT command. The default password value is 0, which indicates PJL security is disabled—any job can modify printer feature settings using the DEFAULT or INITIALIZE commands. If any other password value is active, PJL jobs must issue the correct password value or they are disabled from using the DEFAULT or INITIALIZE commands. (See the “PJL Job Security” section at the end of this chapter.)

- **DISPLAY="*display text* "** — The command option DISPLAY is used to display a job message on the control panel display. The message is displayed when the printer begins to work on this job and is removed when the last page of this job reaches the output bin. The variable "*display text*" can be any combination of printable characters and spaces or horizontal tabs, with a maximum of 80 characters. The actual number of characters displayed depends on the printer. The display limit can be determined by sending an INFO CONFIG command to the printer. The printer will return DISPLAY LINES = *value* and DISPLAY CHARACTER SIZE = *value* as part of the response.

Note For HP LaserJet 4PJ, 4V, 4MV, 5Si, 5SiMx, 5Si Mopier printers, if the LANG variable is set to Japanese, messages are displayed using the JIS X0201-76 character set.

For the LaserJet 4000, 5000, 8000, and 8100 series printers, if LANG is set to POLISH, CZECH, or HUNGARIAN, messages are displayed using the Latin 2 (ISO 8859/2) character set. If LANG is RUSSIAN, messages are displayed using Cyrillic (ISO 8859/5). For LANG=TURKISH, the display is in Latin 5 (ISO 8859/9). This is also true for the HP Color LaserJet 4500 printer, except there is no support for Turkish or Hungarian on this printer.

Comments:

When a JOB command is received, the printer does not recognize the UEL command as a PJL job boundary until an EOJ command is received. UEL commands within a PJL JOB/EOJ command pair are treated as printer language resets; they default the print environment to the PJL Current Environment settings, instead of the User Default Environment.

If your application has status readback capabilities, you can monitor the job status using the USTATUS command with the JOB option. If job status is enabled and the printer receives a JOB command, it returns a job status message.

Note Resetting the page count associated with unsolicited page status affects only future pages. Pages already processed, but not yet printed, are not affected.

JOB commands can be nested. For example, a spooling application can send a PJL job that uses the JOB command to another spooler that encapsulates the spooled job with another JOB/EOJ command pair. When this is done, note that the job name from the outer JOB command is cleared or overwritten by the inner command.

Example: Using the JOB Command to Print Selected Pages

You can use the JOB command with the START and END options to print selected pages of a job. The entire job must be sent to the printer and formatted, but the printer does not begin printing until the page indicated in the START option.

Note If there is a need to print more than one copy of each page, send the job multiple times using the START and END options to print collated copies. Using the SET command or a printer language “number of copies” command to print multiple copies of selected pages causes unexpected results, because the printer counts physical pages, not multi-copy collated pages.

In this example, the JOB command:

- Informs the printer of the beginning of a print job.
- Names the print job “Jim's Job.”
- Instructs the printer to begin printing on page three of the job. (Since the END option is missing, the job prints from page three through the end of the job.)

Note that the name option for the JOB and EOJ commands need not be the same. You may use different names for each.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL JOB NAME = "Jim's Job" START = 3 <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E . . . . PCL Job . . . . <ESC>E
↵<ESC>%-12345X@PJL <CR><LF>
@PJL EOJ NAME = "End of Jim's Job" <CR><LF>
<ESC>%-12345X
```

Example: Using the JOB Command to Monitor Job Status

This example demonstrates a PostScript print job that is spooled before printing. The job actually consists of three separate sections (notice the UEL commands that bound the three sections—the first section does not need a closing UEL command since the printer is already in PJL mode):

- The first section is sent by the spooler. These lines name the print job and send the USTATUS command so the spooler can monitor job status.
- The next section is a PostScript job sent to the spooler from a software application.
- The last section is sent by the spooler to end the job. When the last page is completely printed (in the output tray), the printer returns unsolicited status information notifying the spooler that the job is complete.

```
<ESC%>-12345X@PJL <CR><LF>
@PJL COMMENT **Beginning of Job ** <CR><LF>
@PJL JOB NAME = "TF's Monitor Job" <CR><LF>
@PJL USTATUS JOB = ON <CR><LF>
 <ESC>%-12345X@PJL <CR><LF>
 @PJL ENTER LANGUAGE = POSTSCRIPT <CR><LF>
 %!PS-ADOBE .. PostScript print job ... ^D
 ↩<ESC>%-12345X
↩<ESC>%-12345X@PJL <CR><LF>
@PJL EOJ NAME = "End of TF's Job" <CR><LF>
<ESC>%-12345X
```

Note

If the spooler received a print job that did not use PJL (that is, the application generated a print job that consisted of just “%!PS-ADOBE .. PostScript print job ... ^D”, a LaserJet printer using context-sensitive switching would still print properly (provided PostScript is installed) and the spooler would still receive the unsolicited job status information.

Example: Nested JOB Commands

This example shows a PCL job that was sent to spooler 1, which in turn was sent to spooler 2 (the nested jobs are indented). Note that the first job name is overwritten by the second job name (“Spooler 1 Job”) when the second JOB command is processed.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL JOB NAME = "Printing Job Sent From
↵Spooler 2" <CR><LF>
  <ESC>%-12345X@PJL <CR><LF>
  @PJL COMMENT Printing a PCL job <CR><LF>
  @PJL JOB NAME = "Spooler 1 Job" <CR><LF>
  @PJL SET RESOLUTION = 600 <CR><LF>
    <ESC>%-12345X@PJL <CR><LF>
    @PJL ENTER LANGUAGE = PCL <CR><LF>
    <ESC>E . . PCL print job . .<ESC>E
    ↵<ESC>%-12345X
  ↵<ESC>%-12345X@PJL <CR><LF>
  @PJL EOJ NAME = "End Spooler 1 Job" <CR><LF>
  <ESC>%-12345X
↵<ESC>%-12345X@PJL <CR><LF>
@PJL EOJ NAME = "End Spooler 2 Job" <CR><LF>
<ESC>%-12345X
```

Related Commands:

EOJ, USTATUS, DEFAULT

EOJ Command

The EOJ command informs the printer that the job has completed. Use this command whenever you use the JOB command.

Note The JOB and EOJ commands are always used in pairs. Do not use one without the other.

Syntax:

```
@PJL EOJ [NAME = "job name"] [<CR>]<LF>
```

Parameters:

Parameter	Functional Range	Default
NAME = "*job name*"	Roman-8 characters 33 thru 255, <SP>, <HT>	N/A

- **NAME = "*job name*"** — Using the EOJ command, you can name your print job. The job name variable is a string and must be enclosed in double quotes as shown in the command syntax. The job name string need not be the same name used in the JOB command. If the NAME option is included, the unsolicited end-of-job status includes the job name (if unsolicited job status is enabled).

Comments:

The EOJ command marks the end of the job started with the previous JOB command. The EOJ command:

- Resets the PJL Current Environment variables to their default (NVRAM) values, as if the printer powered down and then powered up again.
- Resets the page number associated with unsolicited page status.

- Terminates the non-printing mode (enabled by using the START/END options). The non-printing mode, if enabled by the last JOB command, only applies to the previously received data, and does not effect any future pages until another JOB command enables the non-printing mode again.

Effect on Unsolicited Job Status

When the printer receives this command, it returns unsolicited job status information, if enabled, when the last page of the job exits the printer and is in the output tray. The EOJ command resets the page number associated with unsolicited page status. Resetting the page count associated with unsolicited page status only affects future pages. Pages already processed, but not yet printed, are not affected.

Related Commands:

JOB, USTATUS

PJL Job Security

HP LaserJet 2100 series, 4000 series, 4500 series, 5000 series, 8000 series, 8100 series, 8500 series, 4/4M Plus, 4V, 4MV, 4Si, 4SiMx, 5, 5M, 5Si, 5SiMx, 5Si Mopier, 5P, 6P, and 6MP printers support the following types of PJL security:

- Password protection of default feature settings—this type of security prevents applications from modifying the printer's default feature settings unless the correct password is specified.
- Control panel lock—prevents users from modifying control panel settings using the control panel keys.
- Disk lock (LaserJet 4V, 4MV, 4000 series, 5000 series, 8000 series, 8100 series, 8500 series, 5, 5M, 5Si, 5SiMx, 5Si Mopier only)—prevents writing to the printer's disk (or flash memory).
- File system initialization—for printers with a PJL file system, the FSINIT command will not initialize the file system unless specified in a secure job.

All types of security are set using the DEFAULT command and queried using DINQUIRE or INQUIRE.

Password Protection of Default Feature Settings

You can use a password to protect the printer's default features by sending the @PJL DEFAULT PASSWORD = *number* command, specifying a number between 1 and 65,535 (the 0 value disables password protection). Once password protection is enabled, the DEFAULT or INITIALIZE commands are disabled unless the correct password is specified in the JOB command. Printer languages, such as PCL and PostScript, are also prevented from changing default variables.

Secure PJL jobs are able to use the DEFAULT and INITIALIZE commands (or printer language commands) to set default features, including the value of the PASSWORD, CPLOCK, and DISKLOCK variables, until the next EOJ command is received.

Control Panel Lock

You can “lock” the control panel by sending the @PJL DEFAULT CPLOCK = ON command. When the control panel is locked, the user cannot change any control panel settings. If the user tries to change any control panel settings, the message “MENUS LOCKED” appears on the control panel display for about 5 seconds. The CPLOCK variable can only be changed from within “secure” PJL jobs (jobs with the correct non-zero PASSWORD value in the JOB command).

For the printers that support the MINIMUM, MODERATE, and MAXIMUM values for CPLOCK, MINIMUM locks out the RESET, CONFIGURATION, and I/O menus. MODERATE locks out the menus locked by MINIMUM, plus the PRINT QUALITY and PAPER HANDLING menus. The MAXIMUM value locks out the menus locked by MODERATE plus the PRINTING and INFORMATION menus and the Job Cancel key (MAXIMUM has the same effect as the ON value).

Disk Lock

On printers which support Disk Lock, you can “lock” volume 0 by sending the @PJL DEFAULT DISKLOCK = ON command. When locked, you cannot write to volume 0 of the file system. It becomes read-only to prevent actions such as formatting, downloading fonts to the disk, deleting disk fonts, etc. If not locked, the disk is read/write. The DISKLOCK variable can only be changed from within a “secure” PJL job (a job that includes the correct, non-zero password value in the JOB command). The DISKLOCK variable is used mainly in networked or printer-shared configurations.

Note

You can use the DINQUIRE command to check the status of the PASSWORD, CPLOCK, and DISKLOCK variables. @PJL DINQUIRE PASSWORD returns ENABLED or DISABLED, @PJL DINQUIRE CPLOCK returns OFF or ON, and @PJL DINQUIRE DISKLOCK returns OFF or ON. You do not have to be in a secure job to use the DINQUIRE command to check these variables.

Example: Using PJL Security

This example demonstrates how to set a password and to lock the control panel so users cannot modify control panel settings. It is assumed the password value at the start of job is 7654. The example changes the password to 1776.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT **Set Password** <CR><LF>
@PJL COMMENT **& Lock Control Panel**<CR><LF>
@PJL JOB PASSWORD = 7654 <CR><LF>
@PJL DEFAULT PASSWORD = 1776 <CR><LF>
@PJL DINQUIRE PASSWORD <CR><LF>
@PJL DEFAULT CPLOCK = ON <CR><LF>
@PJL DINQUIRE CPLOCK <CR><LF>
@PJL EOJ <CR><LF>
<ESC>%-12345X
```

To unlock the control panel, you would send a job similar to the following job. This job specifies the correct password with the JOB command, and then uses the DEFAULT command to unlock the control panel.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT **Unlock Control Panel** <CR><LF>
@PJL JOB PASSWORD = 1776 <CR><LF>
@PJL DEFAULT CPLOCK = OFF <CR><LF>
@PJL DINQUIRE CPLOCK <CR><LF>
@PJL EOJ <CR><LF>
<ESC>%-12345X
```

To write to volume 0 of the file system, you would send a job like the following. This job specifies the correct password with the JOB command, and then uses the DEFAULT command to unlock, and then later to lock the disk.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT **Unlock Volume 0** <CR><LF>
@PJL JOB PASSWORD = 1776 <CR><LF>
@PJL DEFAULT DISKLOCK = OFF <CR><LF>
@PJL DINQUIRE DISKLOCK <CR><LF>
@PJL ENTER LANGUAGE = POSTSCRIPT <CR><LF>
%!PS-ADOBE . . . PostScript print job . . . ^D
↩<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT **Lock Volume 0** <CR><LF>
@PJL DEFAULT DISKLOCK = ON <CR><LF>
@PJL DINQUIRE DISKLOCK <CR><LF>
@PJL EOJ <CR><LF>
<ESC>%-12345X
```

Job Cancellation

HP LaserJet 2100 series, 4000 series, 4500 series, 5000 series, 8000 series, 8100 series, 8500 series, 5, 5M, 5Si, 5SiMx printers and the LaserJet 5Si Mopier support job cancellation using the printer control panel. When a PJL print job is started using the PJL JOB command as described in this chapter, the following PJL information can be obtained from the printer:

- Start of job notification
- End of job notification
- Job cancellation unsolicited status

Each of these pieces of information is described below.

Start of Job Notification

If unsolicited job status is enabled when the printer begins processing the PJL job, the printer responds to the PJL JOB command with an @PJL USTATUS JOB START response. If job ID reporting is enabled by sending @PJL SET JOBID=ON, the printer response includes a job ID number that is associated with the job name supplied in the JOB command.

For example, if the printer receives the following command:

```
@PJL JOB NAME = "job name"
```

If unsolicited job status and job ID reporting are enabled, the printer would generate an ID number (such as 346) and respond with:

```
@PJL USTATUS JOB<CR><LF>
START<CR><LF>
NAME="job name"<CR><LF>
ID=346<CR><LF>
<FF>
```

The printer-generated ID number can range in value from 0 to 32767. Job ID numbers are unique until they roll over to zero or until the printer power is cycled (at which time the ID defaults to 0).

End of Job Notification

Near the end of the PJL job, the application should send the EOJ command as described in this chapter. If unsolicited job status is enabled when the last page of the job is delivered to the output bin, the printer responds to the EOJ command with an @PJL USTATUS JOB END response. If JOB ID reporting is enabled, the response includes a printer-generated ID number associated with the PJL job name provided in the EOJ command. The response also contains a RESULT field. All possible values for the RESULT are shown in the following table:

RESULT Value	Description
OK	The last page of the job was sent to the output bin.
USER_CANCELED	The job was canceled from the control panel.
HOST_CANCELED	The job was canceled from a host system.
RESOURCE_CANCELED	The job was canceled because a resource was not available (for example, the media was not loaded).

Using the previous example, if the printer receives the following command containing the same job name as in the JOB command:

```
@PJL EOJ NAME = "job name"
```

If unsolicited job status and job ID reporting are enabled, the printer would use the ID number associated with that job name and respond with:

```
@PJL USTATUS JOB<CR><LF>
END<CR><LF>
NAME="job name"<CR><LF>
PAGES=123<CR><LF>
ID=346<CR><LF>
RESULT=OK
<FF>
```

If the job had been cancelled instead of completed, the printer would respond with the same message except the RESULT value would be different.

Job Cancellation Unsolicited Status

As soon as the printer receives notification that a job is cancelled, the printer provides the @PJL USTATUS JOB CANCELED message to the driver/spooler if unsolicited job status is enabled. Using the same job name and ID number as the previous example, the printer's response would be:

```
@PJL USTATUS JOB<CR><LF>
CANCELED<CR><LF>
NAME="job name"<CR><LF>
ID=346<CR><LF>
RESULT=USER_CANCELED
<FF>
```

The job name provided in the NAME option of the PJL USTATUS JOB CANCELED response is the current job name if a current job name is available. The current job name is the job name retained in the printer at the time the last PJL JOB command was processed. The current job name could also have been supplied and/or modified using PostScript.

If a job name is supplied in the EOJ command and if unsolicited job status is enabled at the time the EOJ command is parsed, the NAME option of the PJL USTATUS JOB CANCELED response will contain the job name assigned in the EOJ command. Otherwise, the NAME line is eliminated from the response.

6 Environment Commands

Introduction

Hewlett-Packard printers have many features you can set using printer commands or by pressing control panel keys. Since previous jobs can change feature settings to unwanted values, applications should set printer features affecting the print job to a desired state at the beginning of the job.

Setting features to a desired state is easily accomplished using a combination of PJL and printer language commands. This chapter describes sets of printer features known as print environments, and the PJL commands you use to set printer features to a desired state, such as:

- DEFAULT sets the default value for environment variables, storing these values in non-volatile RAM.
- INITIALIZE resets the current and default PJL variables to the factory default values.
- RESET resets the current PJL variables to the default values.
- SET sets an environment variable to a specified value until the next PJL reset condition.

Note For a list of default feature settings, see Appendix A.

Note For information about products newer than those included in this book, see the *Printer Job Language Technical Reference Addendum*, which includes product-specific information about newer products, as well as commands and variables added to PJL to support these newer products.

Print Environments

At any time during printer operation, the printer's current feature settings are referred to collectively as the print environment. When certain printer events occur, such as the incidence of a printer language reset, RESET command, or other PJL reset condition, the print environment settings can default to the settings of other stored environments.

The printer constantly maintains four environments, which are listed below in priority order:

- Factory Default Environment (lowest priority)
- User Default Environment
- PJL Current Environment
- Modified Print Environment (highest priority)

The *Factory Default Environment* holds the initial feature values set at the factory, which can be used for default values when a complete reset is needed. The *User Default Environment* holds the settings modified with the DEFAULT command, or set from the control panel. The print environment defaults to the User Default values when various printer conditions occur, such as the end of a PJL job, a PJL reset condition, or when certain PJL commands are executed. The *PJL Current Environment* contains the current PJL feature settings. When a printer language is entered or a new job begins, the PJL Current Environment settings are loaded into the *Modified Print Environment*, providing a base feature set which the application can modify if needed. After a printer language is entered, feature settings are recorded in the Modified Print Environment.

Note HP LaserJet 4L, 5L, 6L, and 1100 series printers do not have NVRAM. The PJL Default and Current Environment settings are stored in RAM and are reset to the factory default values during a power cycle.

Each environment is explained in more detail below:

- **Factory Default Environment** — This environment consists of a group of feature settings that are permanently stored in the printer. The printer uses these settings when it is powered on for the first time after leaving the factory, and after the INITIALIZE command is received.

- **User Default Environment** — This environment contains the values that are set using the DEFAULT command or the control panel keys. These values are stored in non-volatile RAM (in those printers containing NVRAM). Following any PJL reset condition, these values are placed into the PJL Current Environment. If the printer has a control panel, the User Default values are displayed on the control panel under the appropriate menu.
- **PJL Current Environment** — This environment contains the current PJL feature settings. Current settings are based on the User Default values and any settings modified using the SET command. These values default to the User Default values when a PJL reset condition occurs.
- **Modified Print Environment** — This environment is active as soon as a printer language is entered. At that time, the PJL Current Environment values are loaded into the Modified Print Environment and act as a base set of features. Printer language commands then are used to modify feature settings to the desired state. The PJL Current Environment settings are loaded into the Modified Print Environment whenever a personality is activated or a reset is received, including any printer language reset or PJL reset condition.

Figure 6-1 illustrates how the environments interact, and how they affect the modified print environment.

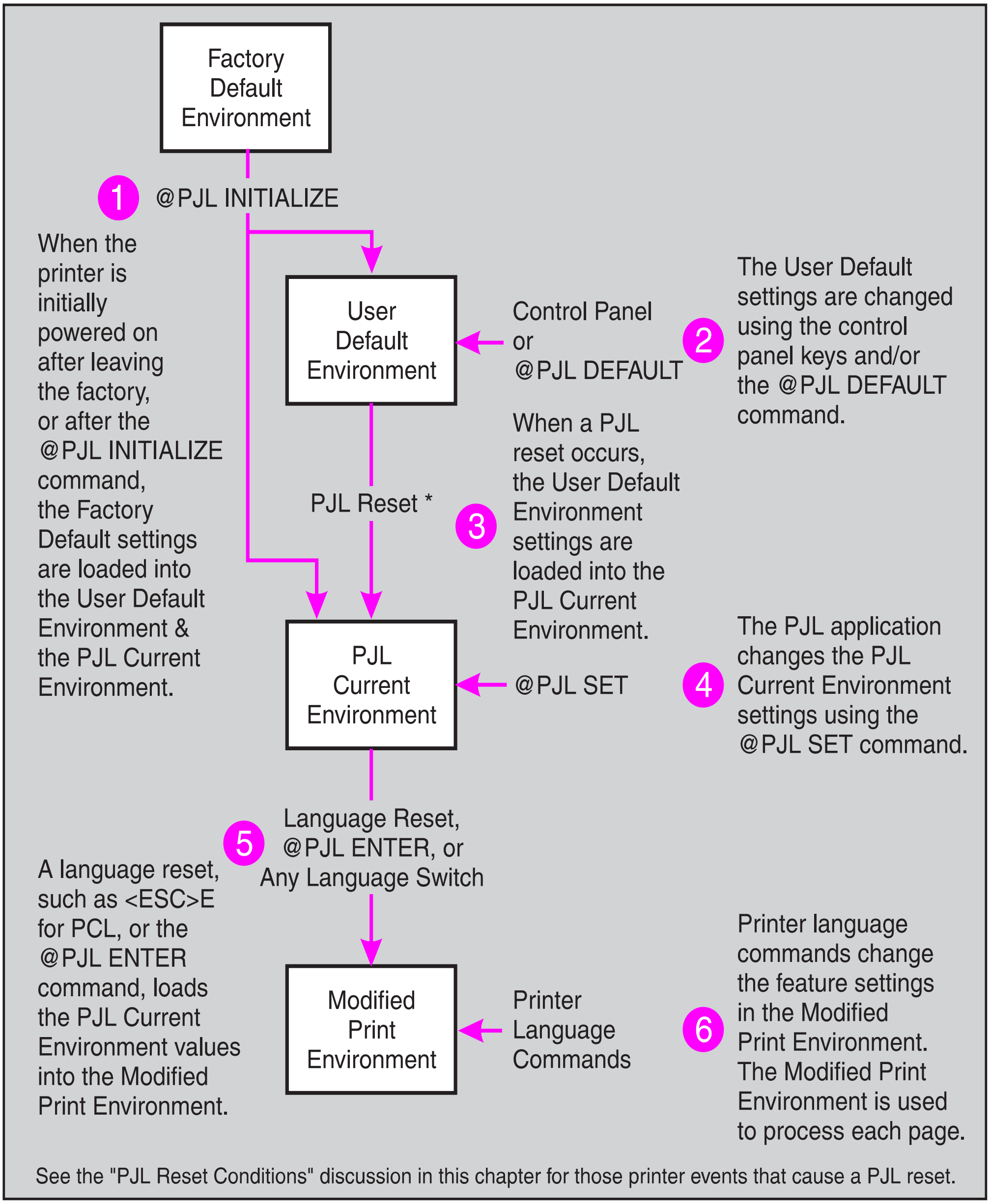


Figure 6-1 How Environments Affect the Print Job

Changing Environment Settings

The following scenario elaborates on how the print environment changes during printer operation. The “number of copies” feature is used to show feature changes as events occur.

1 The first time the printer is turned on after it leaves the factory (or after the INITIALIZE command), the number of copies feature is set to the factory default value of 1 copy.

2 At any point following the initial power-on or the INITIALIZE command, the number of copies feature can be set using the DEFAULT COPIES command in a PJL job or by changing the COPIES = setting on the control panel. This changes the User Default Environment setting to a new value, such as number of copies = 3. The User Default Environment values are not loaded into the PJL Current Environment until the next PJL reset condition occurs. (For printers with control panels, if the printer is currently not processing a job while the feature is changed from the control panel, the printer treats the feature change as a PJL reset condition and loads the newly changed value into non-volatile RAM.)

3 If the PJL job uses the SET COPIES = 5 command to change the number of copies, the PJL Current Environment value changes to the selected setting (for example, 5). Otherwise, the number of copies setting remains the same as set using the DEFAULT command or the control panel (in this example, 3).

4 If the printer language (such as PCL or PostScript) changes the number of copies setting to another value, such as 8, the newly specified printer language value overrides the PJL Current Environment value. If the printer has a control panel, however, it still displays the User Default Environment value set using the control panel keys or the DEFAULT command (3).

5 The next PJL reset condition defaults the number of copies setting to the value set from the control panel or by using the DEFAULT command (User Default Environment). In this example, the number of copies feature setting then defaults to 3 after a PJL reset condition.

All other features operate similarly—if any feature is not modified by a higher priority action, it keeps its current value setting.

Example: Changing Environment Settings

This example shows the values stored in the different environments when commands are issued. The example begins with the number of copies set to 1 in all environments (the Factory Default Environment setting). The table reflects the current settings after each command.

Command Sent	Environment Setting			
	Factory Default	**User Default**	**PJL Current**	**Modified Print**
After PJL INITIALIZE or RESET MENU	1	1	1	1
`@PJL DEFAULT COPIES=3`	1	3	1	1
`@PJL SET COPIES = 4`	1	3	4	4
`@PJL ENTER LANGUAGE=PCL<LF> <ESC>&l5X`	1	3	4	5
`<ESC>%-12345X`	1	3	3	3

Environment Summary

As indicated previously, each print environment differs in relation to how it is stored, how the settings are changed, and how the PJL Current Environment can be defaulted. The table on the following page summarizes the characteristics of each print environment. For those printers without a control panel, disregard any mention of control panels. In these printers, User Default Environment features are controlled using just the DEFAULT command.

Note See Appendix A for a list of environment variables supported by each PJL printer.

Factory Default Environment	Stored permanently in printer memory—settings cannot be modified.
	Factory default settings cannot be read programmatically, but they are listed in the *PCL 5 Comparison Guide*.
User Default Environment	The User Default Environment is set to the factory default values when the printer initially is powered on—before printer commands are sent from an application or any control panel settings are changed.
	Stored in non-volatile RAM in printers that have it—can be changed using the DEFAULT command or control panel keys.
	The INITIALIZE command loads the Factory Default settings into the User Default Environment.
	User default settings can be read using the DINQUIRE command.
PJL Current Environment	Any PJL reset condition loads the User Default Environment feature settings into the PJL Current Environment.
	Always reflects the PJL-level settings currently in use.
	Stored in RAM—can be changed using SET command. These values override feature settings until the next PJL reset condition.
	The INITIALIZE command loads the Factory Default settings into the PJL Current Environment.
	PJL Current Environment settings can be read using the INQUIRE command.
Modified Print Environment (Printer-Language Specific)	Active as soon as printer receives any printer language commands (such as PCL or PostScript commands). This environment contains all of the feature settings currently in effect at any point after a printer language is entered.
	Printer language resets (such as the <ESC>E command in PCL), any printer language switch, or the ENTER command load the PJL Current Environment into the Modified Print Environment.
	Stored in RAM—can be changed using printer language commands (PCL, PostScript, and others). The printer language values override any PJL Current Environment feature for the duration of the printer language job (until the printer language is changed or a printer language-specific reset is executed).
	The Modified Print Environment settings can be read if the active printer language supports this capability.

PJL Reset Conditions

“PJL reset conditions” are listed below. Note that PJL reset conditions differ from printer language resets (such as <ESC>E). Printer language resets load the PJL Current Environment values into the Modified Print Environment. PJL reset conditions are more powerful. They load the User Default values into the PJL Current Environment, and also into the Modified Print Environment.

In this document, the term PJL reset condition refers to any of the following events:

- Power-on
- UEL command (when not between a JOB and EOJ command pair)
- @PJL INITIALIZE command
- @PJL RESET command
- @PJL JOB or EOJ command
- Control panel reset
- Other printer-specific events (see Appendix A for information about job boundaries)

Key Points to Remember About Environments

When using PJL to set the printer to a desired state, remember the following points.

- At the beginning of a PJL job, the current feature settings are the same as the control panel values or those features set with the DEFAULT command.
- When a printer language is entered, the current feature settings (Modified Print Environment) become the same as the PJL Current Environment. From this starting point, the printer language commands modify the feature settings. Printer language commands override all other settings.
- The PJL Current Environment settings can be changed using the SET command. These settings take effect until the next PJL reset condition. Note that since the JOB command causes a reset condition, the SET command should always be used after the JOB command.
- The control panel settings (User Default Environment) can be changed using the control panel or the DEFAULT command. In printers without a control panel, the default settings are modified with only the DEFAULT command.
- The Modified Print Environment settings are changed using printer language commands. These settings take effect for the duration of the printer language job. After a printer language-specific reset, such as <ESC>E for PCL, the PJL Current Environment feature settings are loaded into the Modified Print Environment.
- If the SET command is used in a PJL job, always use the PJL RESET command after the job is completed.

PJL Environment Variables

This section lists the PJL environment variables. General PJL environment variables (those not printer language-specific) are listed first, followed by printer language-specific variables. For most variables except the read-only variables, value settings can be modified using the following commands:

- SET — sets PJL Current Environment settings that remain active until the next “PJL reset condition” (e.g. JOB, EOJ, RESET, INITIALIZE commands—see page 6-8).
- RESET — the PJL RESET command defaults the PJL Current Environment to the User Default Environment (feature settings set with the DEFAULT command or the control panel keys).
- DEFAULT — modifies the User Default settings (stored in NVRAM in those printers containing NVRAM).
- INITIALIZE — defaults all environments to the Factory Default settings.

You can request value settings for printer features using the following two commands:

- INQUIRE — requests the PJL Current Environment settings.
- DINQUIRE — requests the User Default (control panel) settings.

(The INQUIRE and DINQUIRE commands are discussed in Chapter 7.)

Note

Whenever possible, use printer language commands to set printer features. Use PJL commands only when there are no printer language commands available for a desired feature.

When setting printer features with PJL, use the SET and RESET commands if you want to affect the current PJL job only. Using the DEFAULT and INITIALIZE commands affects the current job *and* succeeding jobs (these commands should only be used when you require a command that affects more than just the current job).

General PJL Environment Variables

The following table lists the PJL environment variables that are not printer language-specific. When you use these variables, do not use the LPARM : *personality* option. The range of values for each variable may differ for the various printer models. Appendix A lists the environment variables and indicates which printers support each variable. Another method of obtaining a list of valid variables and the range of values for each variable is to send the INFO VARIABLES command to request this information directly from the printer. See the INFO command in Chapter 7 for more information. You can find valuable information about environment variables in the control panel sections of the user's manual for each printer.

Note Some environment variables can be modified using the DEFAULT command but not the SET command, some can be SET but not modified using DEFAULT, and some are read only variables. Appendix A lists environment variables, including read only variables, for all of the PJL printers.

General PJL Environment Variables		
Variable	**Description**	**Sample Value Range**
AUTOCONT	Returns the autocontinue configuration.	ON, OFF
AUTOSELECT	Sets the default media tray autoselect feature of the printer.	ON, OFF
BINDING	Sets the default relationship of the front and back images on pages printed in duplex.	LONGEDGE, SHORTEDGE

General PJL Environment Variables (continued)		
Variable	**Description**	**Sample Value Range**
BITSPERPIXEL	For PCL 6 only, this variable controls the number of bits per pixel used when printing grayscale or color images. The valid values are dependent on the current setting of RESOLUTION. If RESOLUTION is 300 or 1200, the only valid BITSPERPIXEL value is 1. If RESOLUTION is 600, the only valid BITSPERPIXEL values are 1 and 2. For FastRes 1200 printing, first set the RESOLUTION to 600 and then set BITSPERPIXEL to 2. For ProRes 1200, first set the RESOLUTION to 1200 and then set BITSPERPIXEL to 1.	2, 1
CLEARABLE-WARNINGS	Returns the configuration for displaying clearable warnings (non-fatal error messages cleared by pressing the Continue key.) If the value is set to JOB, then clearable warnings generated by a job are displayed only until the start of the next job. If the value is ON, then clearable warnings are displayed until the user presses the Continue key.	JOB, ON
COMPRESSRASTER STORAGE	Specifies whether or not raster data is to be compressed when the printer runs out of memory. When set ON, the throughput may be slowed down, though more complex images can be processed. The default is ON.	ON, OFF
CONTEXT-SWITCH	Enables/disables the use of implicit personality switching. If a job is sent without an ENTER LANGUAGE command, the printer looks for context clues to determine which personality takes effect. When the personality is changed, memory is reconfigured and all downloaded fonts, PCL macros, and PostScript dictionaries are lost (however, no I/O data is lost).	ON, OFF

General PJL Environment Variables (continued)		
Variable	**Description**	**Sample Value Range**
COPIES	Number of uncollated copies for each page of the job.	1 to 999
COURIER	Sets the version of the Courier font.	REGULAR, DARK
CPLOCK	Sets the default control panel lockout state. If CPLOCK is set to ON, users cannot modify feature settings using the control panel keys. CPLOCK can only be set by a secure job using the DEFAULT command, and can be read using the INQUIRE or DINQUIRE commands. For more information, see the "Control Panel Lock" portion of the "PJL Job Security" section in Chapter 5.	ON, OFF, MINIMUM, MODERATE, MAXIMUM
DENSITY	Returns the toner density setting.	1 to 5
DISKLOCK	*For volume 0 only,* sets the default disk lockout state. If ON, the disk is read-only and it will not be possible to format the disk, download fonts, delete disk fonts, etc. If OFF, reading and writing are enabled. This variable can only be set by a secure job using the DEFAULT command, and only queried using the DINQUIRE command.	ON, OFF
DUPLEX	Sets the default mode to enable/disable printing on both sides of the paper. OFF enables simplex and ON enables duplex printing.	ON, OFF
ECONOMODE	Default for the ECONOMODE toner-saving feature used in many of the LaserJet printers.	ON, OFF
FINISH	Sets the LaserJet 5Si Mopier to staple the printed output.	NONE, STAPLE

General PJL Environment Variables (continued)		
Variable	**Description**	**Sample Value Range**
FORMLINES	Number of lines per page. This variable is tied to both the PAPER and ORIENTATION variables. If the value of either of those variables is changed, then the FORMLINES variable automatically is updated to maintain the same line spacing.	5 to 128
HOLD	Specifies the retention classification of a job, indicating whether a job is printed immediately or stored (see Chapter 10 for more information).	OFF, ON, PROOF, STORE
HOLDKEY	A four-digit string that is specified in the job stream. A HOLDKEY value must be specified if HOLDTYPE is PRIVATE (otherwise, the job will be considered PUBLIC).	"0000" to "9999"
HOLDTYPE	Specifies the privacy level of a stored job.	PUBLIC, PRIVATE
IMAGEADAPT	Default for Image Adapt feature. ON enables Lossy compression for use on any images that need to have compression performed. AUTO causes the printer to evaluate other compression alternatives first before Lossy is considered. OFF disables use of Lossy compression.	ON, OFF, AUTO
IMAGELOCATION	Specifies that DISK storage is or is not to be used for processing raster images when object banding occurs. For printers with a hard disk, the default is DISK. Switching from one mode to another causes a graphics shutdown to occur, that is, the queue of printed prints is reset and the current nest is processed.	DISK, RAM
INTRAY1	Returns the auto-selection lock status for tray 1 (usually the MP tray or upper tray, depending on the printer).	LOCKED, UNLOCKED

General PJL Environment Variables (continued)		
Variable	**Description**	**Sample Value Range**
INTRAY2	Returns the auto-selection lock status for tray 2 (usually the standard cassette or lower cassette, depending on the printer).	LOCKED, UNLOCKED
INTRAY3	Returns the auto-selection lock status for tray 3 (usually the optional cassette or envelope feeder, depending on the printer). INTRAY3 is a valid variable only if installed. If it is not installed, the printer returns “?” instead of LOCKED / UNLOCKED, indicating that the variable is unknown.	LOCKED, UNLOCKED
INTRAY1SIZE	Returns the size of the paper currently installed in tray 1 (usually the MP tray or upper tray, depending on the printer).	LETTER, LEGAL, A3, A4, CUSTOM, A5, LEDGER, EXECUTIVE, JISB4, JISB5, B5 COM10, C5, DL, JPOST, JPOSTD, MONARCH
INTRAY2SIZE	Returns the size of the paper currently installed in tray 2 (usually the standard cassette or lower cassette, depending on the printer).	LETTER, LEGAL, A4, A3, LEDGER, EXECUTIVE, JISB4, JISB5, CUSTOM
INTRAY3SIZE	Returns the size of the paper currently installed in tray 3 (usually the optional cassette or envelope feeder, depending on the printer). INTRAY3SIZE is a valid variable only if currently installed. If it is not installed, the printer returns “?” instead of a paper size, indicating the variable is unknown.	LETTER, LEGAL, A4, A3, LEDGER, EXECUTIVE, JISB4, JISB5, COM10, MONARCH, CUSTOM
INTRAY4SIZE	Returns the size of the paper currently installed in the envelope feeder. INTRAY4SIZE is a valid variable only if the envelope feeder currently is installed. If it is not installed, the printer returns “?” instead of an envelope size, indicating that the variable is unknown.	COM10, MONARCH, C5, DL, B5

General PJL Environment Variables (continued)		
Variable	**Description**	**Sample Value Range**
INTRAY5SIZE	Returns the size of the paper currently installed in the first optional input tray. INTRAY5SIZE is a valid variable only if the optional tray currently is installed. If it is not installed, the printer returns "?" instead of a tray size, indicating the variable is unknown.	LETTER, LEGAL, A4, A3, LEDGER, JISB4, JISB5, EXECUTIVE, CUSTOM
INTRAY6SIZE INTRAY7SIZE INTRAY8SIZE	Returns the paper size currently installed in these optional input trays. INTRAYxSIZE is valid only if the optional tray is installed. If not installed, the printer returns "?" instead of a tray size, indicating the variable is unknown.	LETTER, LEGAL, A4, and others (tray-dependent)
IOBUFFER	Sets the value of the I/O buffering variable.	ON, OFF, AUTO
IOSIZE	Sets up the size, in Kbytes, of the configurable I/O buffers when IOBUFFER=ON. The size is set in increments of 10 Kbytes (up to 100 Kbytes, then in 100 Kbyte increments).	10 to maximum available memory
JOBATTR	Used to append a string to a list of job attribute strings associated with the current job.	"*Attribute String*"
JOBID	Used to enable or disable the job ID information returned in the status readback at the start and end of the job. Both the current and default variables are set when either the SET or DEFAULT command is used. This variable can be set to ON or to its default value of OFF.	OFF, ON
JOBIDVALUE	This variable is used to change the current job ID number. It is used to facilitate reproducible test results. Normally job ID numbers are assigned sequentially by the printer. As a result, job IDs would vary depending on which job ran prior to the current job.	0 to 65535

General PJL Environment Variables (continued)		
Variable	**Description**	**Sample Value Range**
JOBNAME	Assigns a job name to a “Proof and Hold” job. This is different than the NAME variable associated with the JOB command.	“*jobname* string”
JOBOFFSET	Sets the default job offset state.	ON, OFF
LANG	Sets the default display language for the display panel and unsolicited status feedback display panel messages.	ENGLISH, FRENCH, GERMAN, ITALIAN, SPANISH, SWEDISH, CHINESE, JAPANESE, TURKISH, POLISH, NORWEGIAN, and others (see Appendix A)
LOWTONER	Returns configuration for low-toner messages. If ON or CONTINUE, printer remains online when the LOW TONER message is displayed; if OFF or STOP, printer goes offline and waits until On Line or Continue key is pressed.	ON, OFF, STOP, CONTINUE
MANUALFEED	Manual feed mode.	ON, OFF
MARGINS	Sets the margins for the plot. The SMALLER and EXTENDED values are used only with roll-feed plotters to reduce the amount of waste media between plots.	NORMAL, SMALLER, EXTENDED
MEDIASOURCE	Specifies the media source to be used for the next job for devices that allow a sheet of paper to be used without removing the loaded roll of paper.	TRAY1, TRAY2, TRAY3
MEDIATYPE	Sets the default media type for the current PJL job.	PAPER, SPECIAL, TRANSPARENCY, GLOSSY
MIRROR	Horizontal reflection of plots.	ON, OFF

General PJL Environment Variables (continued)		
Variable	**Description**	**Sample Value Range**
MPTRAY	Returns the configuration value of the multi-purpose tray.	CASSETTE, MANUAL, FIRST
ORIENTATION	Page orientation.	PORTRAIT, LANDSCAPE
OUTBIN	Sets the default output bin. (For HP LaserJet 4Si, 4SiMx, 4000 series, 5Si, 5SiMx, 5Si Mopier printers, the UPPER output bin is a face-down, correct-order bin. The LOWER output bin is a face-up reverse-order bin.)	UPPER, LOWER, OPTIONALOUT-PUTBIN1, . . . OPTIONALOUT-PUTBIN62
OUTBINPROCESS	Supplies external finishing devices with the type of finishing requested for the current job. The value is unused by the printer and is simply passed to the device. The actual values are device-specific and therefore are not documented here (the device manufacturer must assign values for the specific processes handled by that device).	0 to 255
OUTLINEPOINTSIZE	Sets the point size used by PCL-XL to switch from printing characters as bitmaps to printing them as outlines.	0 to 999
OUTTONER	Determines how the printer processes a toner- out event. If this variable is set to STOP, printing will stop when a toner-out event occurs. If this variable is set to CONTINUE, a toner-out message will be generated but printing will continue. The default value for this variable is STOP.	STOP, CONTINUE
PAGELENGTH-ACCURACY	Specifies whether the absolute accuracy of the image length can be sacrificed in situations when image banding may occur. For CAD and GIS drawings, the recommended setting is MAXIMUM; for photographic images it is OPTIMIZED (DesignJet 1000 Series).	EXACT, OPTIMIZED, CONSTANT, MAXIMUM

General PJL Environment Variables (continued)		
Variable	**Description**	**Sample Value Range**
PAGEPROTECT	Page protection configuration. The page protection feature reserves a block of printer memory to prevent printer overrun errors (error 21) when formatting very dense or complex images, especially HP-GL/2 images. The variable can be set to any legal value at any time, regardless of the current amount of free memory or the currently set resolution. When a job is sent, if there is not enough memory to print correctly with the current resolution and page protection configuration, the system temporarily overrides the resolution and/or page protect values to run the job. In these cases, the job may be printed at 300 dpi without page protection. When the page protection status is changed, memory is reconfigured and all downloaded fonts, PCL macros, and PostScript dictionaries are lost (however, no I/O data is lost). Refer to "Commands that Affect Printer Memory" in Appendix A.	OFF, LETTER, LEGAL, A4, AUTO, ON
PALETTESOURCE	Specifies how color settings are derived, either from the device's control-panel settings or through the software application.	DEVICE, SOFTWARE
PAPER	Physical paper (and envelope) sizes. Letter, Legal, Ledger, A5, A4, A3, Executive, JISB4, and JISB5 are paper sizes; Com10, C5, DL, Monarch, and B5 are envelope sizes; JPOST and JPOSTD are Japanese postcard sizes; CUSTOM is for feeding different sizes, but it varies with the printer: the LaserJet 4P/4MP printers interpret CUSTOM as odd sizes, such as 3 x 5 cards and labels; the LaserJet 4V/4MV printers interpret CUSTOM as 11.7" x 17.7" paper.	LETTER, LEGAL, A5, A4, EXECUTIVE, LEDGER, A3, COM10, C5, DL, MONARCH, B5, CUSTOM, JISB4, JISB5, JPOST, JPOSTD and others (see Appendix A)

General PJL Environment Variables (continued)		
Variable	**Description**	**Sample Value Range**
PAPERLENGTH	Sets the length of the paper in decipoints (1/720th of an inch).	0 to 432000
PAPERWIDTH	Sets the width of the paper in decipoints (1/720th of an inch).	0 to 432000
PARALLEL	Sets the speed of the parallel port. This will not take effect until the next power cycle.	FAST, SLOW
PASSWORD	Default password for PJL security.	0 to 65535
PERSONALITY	Personality for implicit switching (implicit switching refers to switching to the default personality without explicitly doing so with the @PJL ENTER command). Note that the value string (PCL, POSTSCRIPT, and so on) for each installed personality is defined by the personality itself. If the AUTO option is selected, and a job is sent without an ENTER LANGUAGE command, the printer looks for context clues to determine which personality takes effect (except in the case of ESC/P, which cannot be selected using context switching). When the personality is changed, memory is reconfigured and all downloaded fonts, PCL macros, and PostScript dictionaries are lost (however, no I/O data is lost). Refer to Appendix A, "Commands that Affect Printer Memory." *For the LaserJet 4PJ*, this variable is assigned on a per-port basis (see "Port-Specific Variables"). *For the DeskJet 1200C*, setting this variable to INSTALLED causes the printer to select the default personality from those available. It selects from the available optional personalities before resorting to those available on a standard printer. Reading back the variable identifies the selected variable.	AUTO, PCL, INSTALLED, POSTSCRIPT, ESCP

General PJL Environment Variables (continued)		
Variable	**Description**	**Sample Value Range**
PLANESINUSE	Defines the number of planes of data in a job. A value of 1 indicates a monochrome job, while a value of 3 indicates a color job.	3, 1
POWERSAVE	Enables or disables power-saving feature.	ON, OFF
POWERSAVETIME	Sets the time (in minutes) the printer will remain idle before it enters powersave mode if powersave is on.	1, 15, 30, 60, 120, 180, 240, 280,480
PRINTAREA	INKEDAREA sets the DesignJet to shift the plot to the top/left and advance the page cut in order to save media.	FULLSIZE, INKEDAREA
PRINTQUALITY	Sets the default print quality for the current PJL job.	DRAFT, NORMAL, HIGH
QTY	Sets the number of collated copies of a job.	1 to 999
REFILLDURATION	Specifies the amount of ink to be used when the printer's pens are refilled during printing. NORMAL corresponds to 17 cc, QUICK to 5 cc, taking approximately 150 and 50 seconds respectively.	NORMAL, QUICK

General PJL Environment Variables (continued)		
Variable	**Description**	**Sample Value Range**
REFILLTHRESHOLD	Specifies as a percentage the level of ink remaining in the pen before a refill is started. 100% means that refilling takes place when there is no usable ink remaining in the pen. Lower threshold values cause the printer to analyze the density of colors of the next swaths. If the density is increasing, the refill is done as soon as the threshold value is reached. If the density is decreasing, the refill is delayed until the density starts increasing again or the minimum ink level is reached. Mid-print refill banding is less noticeable in lighter areas of a print. A threshold of 80% means that the printer may start refilling when the ink level has dropped by 80% of the charge level. If the charge level was 15.5 cc, the threshold is reached when 12.4 cc of usable ink remains in the pen.	5 to 100
REFILLTYPE	Specifies when a pen refill is to take place. A SHARP refill is done only between swaths; all passes of the printhead for the current swath are completed before refilling takes place. An INTERLEAVED refill can be done between two passes of the same swath.	INTERLEAVED, SHARP
RENDERMODE	Sets the render mode for the personality.	COLOR, GRAYSCALE
REPRINT	Determines whether pages are reprinted after a paper jam. When AUTO is selected and the amount of RAM installed is below a printer-specific threshold, pages are not reprinted. If the amount of RAM installed is more than this threshold, they are reprinted. The ON setting causes the printer to reprint the job after a paper jam. OFF disables reprinting.	AUTO, OFF, ON

General PJL Environment Variables (continued)		
Variable	**Description**	**Sample Value Range**
RESOLUTION	Print resolution in dots per inch. When a job is sent, if there is not enough memory to run with the current resolution and page protection configuration, the system temporarily overrides the resolution and/or page-protect values to run the job. When the resolution is changed, memory is reconfigured and all downloaded fonts, PCL macros, and PostScript dictionaries are lost (however, no I/O data is lost). Refer to "Commands that Affect Printer Memory" in Appendix A.	300, 600
RESOURCESAVE	Sets the value of the resource-saving variable.	ON, OFF, AUTO
RESOURCE-SAVESIZE	(This variable is set as a personality-specific variable using LPARM : *personality.*) Sets the size of the resource saving area for the specified personality if RESOURCESAVE=ON.	0 to maximum available memory (in 100 Kbyte increments)
RET	Configuration of the Resolution Enhancement hardware. Resolution Enhancement technology (REt) improves the print quality of characters and graphics by smoothing the edges of lines. Most users do not need to adjust this feature since the default setting works well for almost every type of job.	LIGHT, MEDIUM, DARK, ON, OFF, AUTO
USERNAME	Assigns a user name to a "Proof and Hold" job.	"*username* string"

General PJL Environment Variables (continued)		
Variable	**Description**	**Sample Value Range**
TIMEOUT	Duration of I/O timeouts in seconds. If the printer waits longer than the timeout value without receiving any data, it ends the print job and begins accepting data from other I/O ports, if any. In most cases, do not adjust this feature unless the printer times out during normal operation, in which case you can try extending the timeout duration. (See the “Timeouts” description in Appendix A.)	5 to 300
WIDEA4	Changes the margins/printable area of A4 paper so that 80 10-pitch characters may be printed on a line.	NO, YES

Port-Specific Variables (LaserJet 4PJ Only)

The following variable is I/O port-specific in the HP LaserJet 4PJ printer, and can be set and requested using PJL. This variable must be set using the IPARM : *port* option. For the HP LaserJet 4PJ, the valid values for *port* are SERIAL and PARALLEL.

Port-Specific Variables		
Variables	**Description**	**Sample Value Range**
PERSONALITY	Personality for implicit switching (implicit switching refers to switching to the default personality without explicitly doing so with the @PJL ENTER command). Note that the value string (PCL, ESCP, and so on) for each installed personality is defined by the personality itself. When the personality is changed, memory is reconfigured and all downloaded fonts and PCL macros are lost (however, no I/O data is lost). Refer to "Commands that Affect Printer Memory" in Appendix A.	PCL, ESCP

PCL-Specific Variables

The following variables are PCL-specific and can be set and requested using PJL. These variables must be set using the LPARM : PCL option. A sample value range is shown in this table. See Appendix A for the actual value range for each PJL printer, or use the INFO VARIABLES command to request these values from the printer.

Note These variables are listed in alphabetical order, not the order they are used. The recommended order for setting FONTNUMBER, FONTSOURCE, and SYMSET is SYMSET first, then FONTSOURCE, then FONTNUMBER.

PCL-Specific Variables		
Variables	**Description**	**Sample Value Range**
FONTNUMBER	Font number. The valid range for this variable depends on the currently set font source. If the font source contains a default-marked font, the values start at 0; otherwise, the values start at 1. The upper limit depends on the number of installed fonts in the font source. For example, if there are 50 fonts in the font source and there is a default-marked font, the FONTNUMBER values range from 0 to 49. In the same situation without a default-marked font, the values range from 1 to 50. *(continued on the following page)*	0, 1, 2, . . . n

PCL-Specific Variables (continued)		
Variables	**Description**	**Sample Value Range**
FONTNUMBER *(continued)*	If the value of the FONTSOURCE changes, then the FONTNUMBER variable automatically is changed to the lowest numbered font in the new font source (0 if the new font source contains a default-marked font; 1 if it does not). If the SYMSET variable changes, the FONTSOURCE and FONTNUMBER default to the highest priority default-marked font (lowest numbered font). When the printer searches for the highest priority default-marked font, cartridges have the highest priority, then SIMMs, then internal default-marked fonts (downloaded soft fonts have the highest priority, but there cannot be a default-marked soft font). NOTE: the recommended order for setting FONTNUMBER, FONTSOURCE, and SYMSET is SYMSET first, then FONTSOURCE, then FONTNUMBER. Also, if the currently set font source is S while the currently set font number is the highest-numbered soft font, and a soft font is deleted, the FONTSOURCE variable is changed to the next highest priority font source containing a default-marked font. The FONTNUMBER variable is tied to both the FONTSOURCE and SYMSET variables.	0, 1, 2, . . . n

PCL-Specific Variables (continued)		
Variables	**Description**	**Sample Value Range**
FONTSOURCE	The valid values for FONTSOURCE are: ● I (Internal Fonts) ● C, C1, C2 (Cartridge Fonts) ● S (Permanent Soft Fonts) ● M1, M2, M3, M4 (Fonts stored in one of the printer's ROM SIMM slots) The valid values for this variable depend on the currently installed font base. If a font source is specified which does not contain any fonts, then the value is ignored, causing a PJL 27001 error (if verbose unsolicited device status is enabled). The following events automatically change the value of the FONTSOURCE variable to the next highest priority font source containing a default-marked font: if the currently set font source is C, C1, or C2, and the cartridge is removed from the printer; if the currently set font source is S and all soft fonts are deleted; if the currently set font source is S, while the currently set font number is the highest-numbered soft font, and any soft font is deleted. NOTE: the recommended order for setting FONTNUMBER, FONTSOURCE, and SYMSET is SYMSET first, then FONTSOURCE, then FONTNUMBER.	I, M1, M2, M3, M4, C, C1, C2, S (the number of cartridge and SIMM slots varies by printer)

PCL-Specific Variables (continued)

Variables	Description	Sample Value Range
LINETERMINATION	Sets the default PCL line termination value: **0**: CR = CR, LF = LF, FF = FF (no change) **1**: CR replaced by CR-LF, LF = LF, FF = FF **2**: CR = CR, LF replaced by CR-LF, FF replaced by CR-FF **3**: CR replaced by CR-LF, LF replaced by CR-LF, FF replaced by -->CR-FF	0, 1, 2, 3
PITCH	Pitch of the default font in units of characters per inch (the default font must be a fixed-pitch scalable font). The pitch value can be specified to two decimal places.	0.44, 0.45, . . . 99.99
PTSIZE	Height of the default font in units of points (the default font must be a proportional scalable font). The point size is significant to a quarter of a point.	4.00, 4.25, . . . 999.75
SYMSET	Symbol set. (If the currently selected SYMSET is WIN3.1J, then the default PCL text parsing method is set to Shift-JIS compatible parsing [WIN3.1J is only available in the HP LaserJet 4PJ, the HP LaserJet 4LJ Pro, and the HP LaserJet 4V/4MV when ESC/P is installed].) On the HP LaserJet 4LC printer, if the SYMSET is GB2312 the default PCL text parsing method is set to GB-compatible parsing. [GB2312 is only available in the HP LaserJet 4LC printer.]	ROMAN8, ISOL1, ISOL2, ISOL5, ISOL6, PC775, PC8, PC8DN, PC850, PC852, PC8TK, PC1004, WINL1, WINL2, WINL5, DESKTOP, PSTEXT, MSPUBL, MATH8, PSMATH, PIFONT, LEGAL, ISO4, ISO6, ISO11, ISO15, ISO17, ISO21, ISO60, ISO69, WIN30, WIN31J, WINBALT, GB2312, MCTEXT

PostScript-Specific Variables

The following table lists the currently defined PostScript-specific variables. These variables can be set using the LPARM : POSTSCRIPT option.

Variable	Description	Sample Value Range
ADOBEMBT	Normally, when PostScript formats a page in memory for printing, it formats a full page (full frame). This is the normal operation for PostScript (Adobe MBT set to OFF). In order for the printer to format full frame it must have sufficient memory to store the full page. If there is not sufficient memory the printer will perform some compression on the page to get it to fit in memory. Printed images on these pages may result in the loss of some detail from the original. This formatting method requires considerable memory. With ADOBEMBT ON (enabled), the printer formats a PostScript page in strips. This method does not require as much memory and will not result in loss of detail in images, however it is a little slower and can require up to 20% more formatting time. With ADOBEMBT set to AUTO, the printer will select either full frame, depending on the selected page size and the amount of memory available, or ADOBE MBT. For example, if letter is the page size and the printer has 7 Mb of memory available, the printer will print full frame (disable MBT); if less than 7 Mb is available, the printer will enable MBT and process the page in strips.	OFF, ON, AUTO
JAMRECOVERY	Enables or disables the printing of jammed pages following a paper jam. The OFF setting boosts printer performance, but lost pages are not automatically printed after clearing the jam.	OFF, ON
PRTPSERRS	This variable enables or disables the printing of a PostScript error page.	OFF, ON

ESC/P-Specific Variables

The following table lists the currently defined ESC/P-specific variables which are valid only for HP LaserJet 4PJ and 4LJPro printers, and optionally for HP LaserJet 4V and 4MV printers. These variables can be set using the LPARM : ESCP option. Note that HP LaserJet 4PJ, 4V, and 4MV factory defaults for these variables are in parentheses.

Note If ESC/P is installed in HP LaserJet 4V and 4MV printers and a menu reset or cold reset is performed, the printer defaults to FONTNUMBER = 0, FONTSOURCE = I, SYMSET = ROMAN8 and PERSONALITY = AUTO. To re-establish ESC/P as the default personality, set ESC/P as the default personality using PJL or the control panel (in Japan, users can send the ESCPDEF.PJL file).

To print Japanese via PCL using the MS Mincho or MS Gothic typefaces, set the SYMSET to WIN31J, FONTSOURCE to the SIMM slot containing the MS Mincho or MS Gothic font (usually M4), and set FONTNUMBER to 1 for MS Mincho or 2 for MS Gothic. Also set the personality to AUTO or PCL. (Alternatively, in Japan, users can configure the printer for PCL using the PCLDEF.PJL file.)

Variable	Description	Sample Value Range
CARRIAGE-RETURN	Controls how ESC/P interprets the carriage return (CR) control character. The valid values for CARRIAGERETURN are: CR–CR maps to carriage return;CRLF–CR maps to carriage return and linefeed.	(CR), CRLF
CHARACTER-SET	Default character set used for 1-byte printing. Valid values for CHARACTERSET are: KANA–Use katakana character set; EG–Use extended graphics character set.	(KANA), EG
TOPMARGIN	Valid values for TOPMARGIN are: TM19MM–sets top margin to 19 mm; TM6MM–sets top margin to 6 mm.	(TM19MM), TM6MM
ANKCONDENSE	Enables or disables whether alphanumeric/kana (ANK) characters are printed in condensed mode by default.	ON, (OFF)
FONT	Default font used when printing in Kanji mode.	(MSMINCHO) MSGOTHIC

Setting the Printer to a Desired State

At the beginning of each print job, printer features which affect the printed output must be set to a desired state to print the job as expected. This can be accomplished in two ways:

- If the printer has a control panel, the user sets the control panel to values that are appropriate for all users sharing the printer.
- For features that must be set on a job-by-job basis, use printer language commands. If a feature cannot be set with a printer language, use PJL.

Applications that generate print data, such as word processors, spreadsheets, and graphics programs, should ensure that the printer is set to a desired state as follows (see Chapter 10 for a description of the various application types):

1 Send the UEL command (<ESC>%-12345X) to start PJL and to default the print environment to the User Default Environment settings.

2 Use the SET command to modify any currently defined environment variables that cannot be set using the desired printer language. For example, use PJL to set variables such as RET or PAGE PROTECTION that cannot be set with a printer language; then use PCL or another printer language to set the remaining environment variables, such as orientation and number of copies.

Note Do not set features that you do not enable users to set from your application. Any feature set by the application should enable the user to control that feature—this strategy prevents the user from being “locked out” of a particular feature.

3 Enter the desired printer language and use printer language commands to set all other environment variables to the desired settings.

4 If using a SET command to modify an environment variable, use a RESET command to return to its default state.

Example: Setting the Printer to a Desired State

The following example demonstrates setting HP LaserJet 4 and 4M printers to a known state. For the specific printer you are configuring, consider which environment features you can modify. The modifiable environment features for HP LaserJet 4 and 4M printers are listed below (see Appendix A for a list of environment variables supported by each PJL printer):

COPIES	FORMLINES
PAPER	MANUALFEED
ORIENTATION	RET
PAGEPROTECT	PERSONALITY *
RESOLUTION	TIMEOUT *
FONTSOURCE	PTSIZE
FONTNUMBER	SYMSET
PITCH	PRTPSERRS
* PERSONALITY and TIMEOUT do not affect the printed output and generally should not be used.	

Of these HP LaserJet 4 and 4M features, only RET, PAGEPROTECT, and RESOLUTION affect the printed output and cannot be set using the printer language (in this case, PCL). These features are set using PJL, as the following lines show:

```
<ESC>%-12345X@PJL <CR><LF>
@PJL SET RET = MEDIUM <CR><LF>
@PJL SET PAGEPROTECT = OFF <CR><LF>
@PJL SET RESOLUTION = 300 <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E . . Use PCL to set copies, paper,
orientation, line spacing, manual feed, and font
selection— values not set using PJL <ESC>E
⤾<ESC>%-12345X@PJL <CR><LF>
@PJL RESET <CR><LF>
<ESC>%-12345X
```

DEFAULT Command

The DEFAULT command sets the User Default Environment value for the specified environment variable. This value is stored in non-volatile RAM (if the printer has NVRAM) and is activated following a PJL reset condition. The DEFAULT command does not affect the current print environment, but takes effect when a PJL reset condition occurs. Use this command to change the default value for any environment setting.

For printers that support the PASSWORD variable, the DEFAULT command will not take effect unless used within a secure job (a job with the correct password in the JOB command).

Note In situations where the printer is shared by several users, such as networks, restrict the use of the DEFAULT command using PJL security mechanisms. This recommendation allows a standard print environment to be used and avoids having default features changed by different print jobs. Instead, if a printer feature must be changed from the default for a particular print job, use the SET command. In this way, jobs can be successfully printed in any order, since they are not affected by settings from previous jobs.

When the DEFAULT command is used to change the PAGE-PROTECT, RESOLUTION, RESOURCESAVE, RESOURCESAVESIZE, IOBUFFER, or IOSIZEstatus, the printer memory is reconfigured. Reconfiguring printer memory erases all downloaded fonts, PCL macros, and PostScript dictionaries, however no I/O data is lost. Refer to “Commands that Affect Printer Memory” in Appendix A.

Syntax:

```
@PJL DEFAULT [LPARM : personality |
IPARM : port] variable = value [<CR>]<LF>
```

- **LPARM : *personality*** — This optional parameter is used to set personality-specific environment variables. PCL is a valid personality. Other personalities, such as PostScript, can be added as hardware options. Use the INFO CONFIG command to request the range of values for all personalities installed in a particular printer.
- **LPARM : *personality*** — This option must be used when setting personality-specific variables.

- **IPARM : *port*** — This optional parameter is used to set port-specific variables. The HP LaserJet 4PJ is the only printer which supports port-specific variables.
- **IPARM : *port*** — This option must be used when setting port-specific variables. Valid values for port for the HP LaserJet 4PJ printer are SERIAL and PARALLEL.
- ***variable* = *value*** — This parameter sets one of the environment variables to the specified value. For example, the @PJL DEFAULT RESOLUTION = 600 command sets the default resolution to 600 dots per inch. See Appendix A for a list of variables and values for each printer. If you need a more detailed description of a particular variable, see the "Environment Variables" section earlier in this chapter.

Note The supported variables and range of values for each variable may not be the same in all HP LaserJet printer models. See Appendix A for a list of the variables and range of values for each PJL printer. You can also obtain valid variables and the range of values for each variable by sending the INFO VARIABLES command to request this information directly from the printer.

Parameters:

Parameter	Variable Names	
personality	PCL	ESCP
	POSTSCRIPT	(Other personalities may also be supported)
port	PARALLEL	Supported on LaserJet 4PJ only
	SERIAL	
variable	Valid variables for each printer are listed in Appendix A.	
value	Appropriate values for each variable are also listed in Appendix A.	

Comments:

The DEFAULT command enables you to specify default values for either general variables, which are used by all personalities, or personality-specific variables. All personality-specific variables, such as the default PCL symbol set or the PostScript-specific variable

PRTPSERRS, must be set using this option. Variables that are not personality-specific cannot be set using the LPARM : *personality* option.

All port-specific variables must be set using the IPARM: *port* option. Variables that are not port-specific cannot be set using the IPARM : *port* option.

Default values set with this command affect the printer control panel value and the feature setting stored in non-volatile RAM (in those printers that have a control panel and NVRAM). However, these values do not affect the print environment until a PJL reset condition occurs (see “PJL Reset Conditions” for a list of printer events that constitute a PJL reset). Consequently, if you want the default values to take effect immediately, send a RESET command after sending the DEFAULT command(s).

A separate DEFAULT command must be sent for each environment variable you specify. The command may be used to set any environment variable except the read-only variables. See the “Environment Variables” section of this chapter for a description of each environment variable.

Example: Modifying User Default Settings

This example sets page protection to LETTER for all personalities, and selects the PC8 symbol set for all PCL jobs. A RESET command follows the DEFAULT commands so that the PJL Current Environment defaults to the new settings.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT User Defaults <CR><LF>
@PJL DEFAULT PAGEPROTECT = LETTER <CR><LF>
@PJL DEFAULT LPARM : PCL SYMSET = PC8 <CR><LF>
@PJL RESET <CR><LF>
<ESC>%-12345X
```

Related Commands:

RESET, SET, JOB, EOJ, UEL

INITIALIZE Command

The INITIALIZE command resets the PJL Current Environment and the User Default Environment variables to their Factory Default values. This command does not affect the I/O configuration values, some of the configuration values, and the unsolicited status settings. Use the INITIALIZE command to set the printer environment values to their factory default state, such as when you move the printer to a new installation site. (This command is not intended for frequent use, since it resets most environments and control panel settings.)

For printers that support the PASSWORD variable, the INITIALIZE command will not take effect unless it is used within a secure job (if a password is in use, a secure job is one that contains the correct password in the JOB command).

Note In situations where the printer is shared by several users, such as networks, restrict the INITIALIZE command. This recommendation allows a standard print environment to be used and avoids having default features changed by different print jobs. In this way, jobs may be successfully printed in any order since they are not affected by settings from previous jobs.

Syntax:

```
@PJL INITIALIZE [<CR>]<LF>
```

Parameters:

The INITIALIZE command has no parameters.

Comments:

The INITIALIZE command resets the following environment variables to their Factory Default values.

Note Because personalities can be dynamically added to some HP LaserJet printers, these printers support more personality-specific variables than those listed here. In any case, the INITIALIZE command causes the PJL Current and User Default environment values for all personalities to default to their factory default state.

Variable Names	
BINDING	ORIENTATION
COPIES	OUTBIN
CPLOCK	PAGEPROTECT
DISKLOCK	PAPER
DUPLEX	PASSWORD
ECONOMODE	PERSONALITY
FINISH	QTY
FORMLINES	REPRINT
IMAGEADAPT	RESOLUTION
JOBOFFSET	RET
MANUALFEED	TIMEOUT
PCL-Specific Variables	
FONTNUMBER	PTSIZE
FONTSOURCE	SYMSET
PITCH	
PostScript-Specific Variables	
JAMRECOVERY	PRTPSERRS
ESC/P-Specific Variables	
ANKCONDENSE	FONT
CARRIAGERETURN	TOPMARGIN
CHARACTERSET	

Note The environment variables may vary with different HP LaserJet printer models. See Appendix A for a list of valid variables, or send the INFO VARIABLES command to request this information directly from the printer.

Example: Using the INITIALIZE Command

This example initializes the printer:

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Initialize settings to <CR><LF>
@PJL COMMENT factory defaults <CR><LF>
@PJL INITIALIZE <CR><LF>
<ESC>%-12345X
```

Related Commands:

DEFAULT, RESET, SET

RESET Command

The RESET command resets the PJL Current Environment variables to their User Default values. This command has the same effect on the PJL Current Environment as power-cycling the printer. Use this command at the end of PJL jobs that use the SET command to set the printer back to its default state.

Syntax:

```
@PJL RESET [<CR>]<LF>
```

Parameters:

The RESET command has no parameters.

Comments:

Any time an application such as a Spooler or Print Data Generator uses the SET command to set PJL variables, the application should conclude with the RESET command (before the closing UEL command) to return the variables to their previous state. (See Chapter 11 for more information about Spoolers and Print Data Generators.)

The RESET command must also be sent after the DEFAULT command if the new default values are to take effect immediately within the same job (see the DEFAULT command example on page 6-37).

The RESET command resets the following environment variables to their user default values.

Note

Because personalities can be dynamically added to some HP LaserJet printers, those printers support more personality-specific variables than those listed here. In addition, the allowable variables and range of values for each variable may not be the same in all HP LaserJet printer models. To obtain valid variables and the range of values for each variable, send the INFO VARIABLES command to request this information directly from the printer. In any case, the RESET command causes the PJL Current Environment values for all personalities to default to the User Default values.

Variable Names	
BINDING	ORIENTATION
COPIES	OUTBIN
CPLOCK	PAGEPROTECT
DISKLOCK	PAPER
DUPLEX	PASSWORD
ECONOMODE	PERSONALITY
FINISH	QTY
FORMLINES	REPRINT
IMAGEADAPT	RESOLUTION
JOBOFFSET	RET
MANUALFEED	TIMEOUT
PCL-Specific Variables	
FONTNUMBER	PTSIZE
FONTSOURCE	SYMSET
PITCH	
PostScript-Specific Variables	
JAMRECOVERY	PRTPSERRS
ESC/P-Specific Variables	
ANKCONDENSE	FONT
CARRIAGERETURN	TOPMARGIN
CHARACTERSET	

Example: Using the RESET Command

The following example uses a RESET command after the print job to return the features to their previous state:

```
<ESC>%-12345X@PJL <CR><LF0>
@PJL COMMENT Resets variables to <CR><LF>
@PJL COMMENT control panel settings <CR><LF>
@PJL SET RESOLUTION = 600 <CR><LF>
@PJL SET RET = MEDIUM <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E . . . PCL job . . . <ESC>E
⤶<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Reset to return to <CR><LF>
@PJL COMMENT control panel settings <CR><LF>
@PJL RESET <CR><LF>
<ESC>%-12345X
```

Related Commands:

DEFAULT, INITIALIZE, SET

SET Command

The SET command enables you to change the value of PJL Current Environment variables for the duration of a PJL job, or until a PJL reset condition defaults the value. Use this command to create a job-specific environment.

Note When the SET command changes the PAGEPROTECT or RESOLUTION status, printer memory is reconfigured (except for printer memory in the HP LaserJet 4L printer). This erases all downloaded fonts, PCL macros, and PostScript dictionaries, however no I/O data is lost. Memory is not reconfigured unless the PAGEPROTECT or RESOLUTION status actually changes from its previous setting. When these settings are changed, performance is affected since all processed data is printed before memory reconfiguration occurs. (Refer to “Commands that Affect Printer Memory” in Appendix A.)

Syntax:

```
@PJL SET [LPARM : personality | IPARM : port]
↵variable = value [<CR>]<LF>
```

- **LPARM :** ***personality*** — This optional parameter is used to set personality-specific environment variables. For example, you can use this option to set the PCL symbol set.

  PCL is a valid personality; other personalities, such as PostScript, can be added into the printer as hardware options (cartridges or ROM SIMMs). Use the INFO VARIABLES command to request the range of values for all personalities in a particular printer.

  The LPARM : personality option must be used when setting personality-specific variables.

- **IPARM :** ***port*** — This optional parameter is used to set port-specific variables. The HP LaserJet 4PJ is the only printer which supports port-specific variables.

  The IPARM : *port* option must be used when setting port-specific variables. Valid values for port for the HP LaserJet 4PJ printer are SERIAL and PARALLEL.

- ***variable* = *value*** — this parameter sets one of the environment variables to the specified value. For example, the @PJL SET RESOLUTION = 600 command sets the current resolution to 600 dots per inch. See the table below for all valid variables and values. If you require a more detailed description of a particular variable, see the “Environment Variables” section earlier in this chapter.

Note The permissible environment variables and range of values for each variable may not be the same in all HP LaserJet printer models. See Appendix A for a list of valid variables and the range of values for each variable, or send the INFO VARIABLES command to request this information directly from the printer.

Parameters:

Parameter	Variable Names	
personality	PCL	ESCP
	POSTSCRIPT	Other personalities may be supported
port	PARALLEL	Supported on LaserJet 4PJ only
	SERIAL	
variable	Valid variables for each printer are listed in Appendix A.	
value	Appropriate values for each variable are also listed in Appendix A.	

Comments:

The SET command enables you to specify either general variables which are used by all personalities, or printer language-specific variables. Printer language-specific variables must be specified using the LPARM : *personality* option. Features that are not printer language-specific cannot be specified with the LPARM option.

All port-specific variables must be set using the IPARM : *port* option. Variables that are not port-specific cannot be set using the IPARM : *port* option.

Values modified with the SET command do not affect the User Default Environment values. Feature settings changed with the SET command are valid until the next PJL reset condition.

A separate SET command must be sent for each environment variable you specify. The command may be used to set any environment variable except CPLOCK, DISKLOCK, PASSWORD, and the read-only variables. See the "Environment Variables" section of this chapter for a discussion of each environment variable.

Note If the SET command is used in a job, use the RESET command after the job to reset features to the User Default (control panel) values. See the following example for a demonstration of how to use the RESET command to "clean up" after using SET.

Example: Using the SET Command

This example uses the SET command to create a desired state before sending a PostScript job. The SET command is used only to set those features that affect the printed output and that cannot be set using the desired personality. After the job has been sent, the RESET command is issued to return all features to their default values.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Setting PostScript Job <CR><LF>
@PJL COMMENT to Desired State <CR><LF>
@PJL SET RET = MEDIUM <CR><LF>
@PJL SET PAGEPROTECT = OFF <CR><LF>
@PJL SET RESOLUTION = 600 <CR><LF>
@PJL ENTER LANGUAGE = POSTSCRIPT <CR><LF>
%!PS-ADOBE ... PostScript print job — use
⤷POSTSCRIPT code to set all values that are
⤷not set using PJL... ^D
<ESC>%-12345X@PJL <CR><LF>
@PJL RESET <CR><LF>
<ESC>%-12345X
```

Related Commands:

DEFAULT, INITIALIZE, RESET, JOB, EOJ

7 Status Readback Commands

Introduction

PJL allows applications to request configuration and status information from the printer. The printer also can be programmed to send unsolicited status information to the application when printer events occur. For example, the printer can send status information indicating the printer door is open, toner is low, online/offline status, the text displayed on the control panel, and other pertinent information.

PJL status readback is especially useful during application development. Status readback enables you to determine that your application successfully changed feature settings to your specifications.

This chapter describes the requirements for using status readback, and explains the following status readback commands:

- INQUIRE requests the *current* value (PJL Current Environment) for a specified environment variable.
- DINQUIRE requests the *default* value (User Default Environment) for a specified environment variable.
- ECHO returns a comment to the host computer to synchronize status information.
- INFO requests a specified category of printer information.
- USTATUS allows the printer to send unsolicited status messages, including device, job, page, and timed status.
- USTATUSOFF turns off all unsolicited status.

This chapter also explains job recovery.

Note For information about products newer than those included in this book, see the *Printer Job Language Technical Reference Addendum*, which includes product-specific information about newer products, as well as commands and variables added to PJL to support these newer products.

Printer Status Requirements

To receive status information from the printer, the application must have program code that handles the status information sent from the printer.

Synchronizing Status Readback Responses

Status responses are directed to the printer's I/O port from which the request is received. When using status readback, applications must synchronize status messages to ensure that status responses are indeed the requested status. To clear any possible unread status responses requested by previous applications, upon starting up, an application should use the ECHO command as described in the ECHO command section later in this chapter.

If unsolicited status is enabled, applications should properly handle receiving unsolicited status responses at any time. In particular, be aware that applications may receive an unsolicited status response after requesting printer status information.

The application and printer must be in a printer environment that supports two-way communication between the application and the printer. Printer sharing devices, networks, and other printing system components may not support this bi-directional communication. (Refer to “Using Status Readback in a Multi-User System” in Chapter 11.)

Format of Status Readback Responses

When PJL sends printer status information to the host, the response is in a readable ASCII format that always begins with the @PJL prefix and ends with a <FF> character. For example, the readback response for the INQUIRE command is:

```
@PJL INQUIRE [LPARM:personality | IPARM:port]
↪variable<CR><LF>
value<CR><LF>
<FF>
```

Your application should be able to read all the data between the "@PJL" header and the <FF> control code.

Lines within the PJL status response begin with a specific keyword, as described in the command descriptions in this chapter, and end with the <CR><LF> control codes. Future printers may support new keywords in the PJL status response. Your application should ignore those lines which it does not understand.

The format of the printer response for each STATUS READBACK command is described in the command descriptions.

INQUIRE Command

The INQUIRE command is used to obtain the current value of a specified PJL environment variable, including read-only variables. Use the INQUIRE command to find out the setting for a particular PJL feature, such as ORIENTATION.

Syntax:

```
@PJL INQUIRE [LPARM : personality |
IPARM : port] variable [<CR>]<LF>
```

Response Syntax:

```
@PJL INQUIRE [LPARM:personality |
IPARM:port] variable <CR><LF>
value <CR><LF>
<FF>
```

- **LPARM : *personality*** — This optional parameter is used to inquire about printer language-specific environment variables. For example, you can use this option to request the current PCL symbol set stored in the PJL Current Environment.

  PCL is a valid personality. Other personalities, such as POSTSCRIPT, can be added as hardware options. Use the @PJL INFO CONFIG command to request the personalities installed in a particular printer.
- **IPARM : *port*** — This optional parameter is used to set port-specific variables. The HP LaserJet 4PJ is the only printer which supports port-specific variables.

  The IPARM : *port* option must be used when setting port-specific variables. Valid values for port for the HP LaserJet 4PJ printer are SERIAL and PARALLEL.
- ***variable*** — This parameter specifies the environment variable you want. For example, the INQUIRE RET command requests the current value of the Resolution Enhancement technology feature. See Appendix A for a list of valid variables for each printer. If you require a more detailed description of a particular variable, see the “Environment Variables” section in Chapter 6.

Note The permissible variables and range of values for each variable may not be the same in all HP LaserJet printer models. See Appendix A for a list of valid variables, or send the @PJL INFO VARIABLES command to request this information directly from the printer.

- ***value*** — This parameter is the returned value of the requested variable. For example, if you send the @PJL INQUIRE COPIES command, and the PJL Current Environment setting is 65, the returned value is 65, indicating 65 copies. See Appendix A for variable names for each parameter.

Parameters:

Parameter	Variable Names+	
personality	PCL	ESCP
	POSTSCRIPT	(other personalities may be supported)
port	PARALLEL	Supported on HP LaserJet 4PJ only
	SERIAL	
variable	Valid variables for each printer are listed in Appendix A.	
value	Acceptable values for each variable are also listed in Appendix A.	

Comments:

If your application has status readback capabilities, you can request the current setting of any valid environment variable. Since the INQUIRE command returns only the value for one feature, you can send multiple INQUIRE commands to request information about more than one feature. If you need information about many variables, the PJL INFO VARIABLES command returns the PJL Current Environment settings for all environment variables.

If the printer does not support the variable, the response is:

```
@PJL INQUIRE [LPARM:personality | IPARM:port]
↵variable <CR><LF>
"?"<CR><LF>
<FF>
```

If a printer language-specific variable is not available because that printer language is not installed or is invalid, or if a port-specific variable is not available because that port is not supported, the command will return an appropriate error code if USTATUS DEVICE=VERBOSE is enabled.

Note

The LPARM : *personality* option must be used when requesting printer language-specific information.

The IPARM : *port* option must be used when requesting port-specific information.

Example: Using INQUIRE to Request Feature Settings

This example requests the current print environment settings for RET, PAGEPROTECT, RESOLUTION, PERSONALITY, and TIMEOUT. The printer response for this example is listed below.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT ***Inquiring About <CR><LF>
@PJL COMMENT Environment Settings*** <CR><LF>
@PJL ECHO 02:18:23.9 05-30-92 <CR><LF>
@PJL INQUIRE RET <CR><LF>
@PJL INQUIRE PAGEPROTECT <CR><LF>
@PJL INQUIRE RESOLUTION <CR><LF>
@PJL INQUIRE PERSONALITY <CR><LF>
@PJL INQUIRE TIMEOUT <CR><LF>
<ESC>%-12345X
```

For the HP LaserJet 4 printer, a sample printer response for this example is as follows. Other PJL printers may respond differently.

```
@PJL ECHO 02:18:23.9 05-30-92<CR><LF>
<FF>
@PJL INQUIRE RET<CR><LF>
MEDIUM<CR><LF>
<FF>
@PJL INQUIRE PAGEPROTECT<CR><LF>
OFF<CR><LF>
<FF>
@PJL INQUIRE RESOLUTION<CR><LF>
600<CR><LF>
<FF>
@PJL INQUIRE PERSONALITY<CR><LF>
AUTO<CR><LF>
<FF>
@PJL INQUIRE TIMEOUT<CR><LF>
15<CR><LF>
<FF>
```

Example: Using INQUIRE for Printer Language-Specific Variables

This example requests the PCL settings for pitch, point size, and symbol set.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Requesting PCL Settings <CR><LF>
@PJL ECHO 12:22:23.9 11-05-92 <CR><LF>
@PJL INQUIRE LPARM : PCL PITCH <CR><LF>
@PJL INQUIRE LPARM : PCL PTSIZE <CR><LF>
@PJL INQUIRE LPARM : PCL SYMSET <CR><LF>
<ESC>%-12345X
```

For the HP LaserJet 4 printer, the response for this example is shown on the following page. Other PJL printers may respond differently.

```
@PJL ECHO 12:22:23.9 11-05-92<CR><LF>
<FF>
@PJL INQUIRE LPARM:PCL PITCH<CR><LF>
10.00<CR><LF>
<FF>
@PJL INQUIRE LPARM:PCL PTSIZE<CR><LF>
12.00<CR><LF>
<FF>
@PJL INQUIRE LPARM:PCL SYMSET<CR><LF>
ROMAN8<CR><LF>
<FF>
```

Related Commands:

DINQUIRE, ECHO, INFO, SET, DEFAULT, USTATUS

DINQUIRE Command

The DINQUIRE command is used to obtain the default value of a specified PJL environment variable. Use the DINQUIRE command to find the User Default Environment setting for any environment variable, including read-only variables.

Syntax:

```
@PJL DINQUIRE [LPARM : personality |
↵IPARM : port] variable [<CR>]<LF>
```

Response Syntax:

```
@PJL DINQUIRE [LPARM:personality |
↵IPARM:port] variable <CR><LF>
value<CR><LF>
<FF>
```

- **LPARM :** ***personality*** — This optional parameter is used to inquire about printer language-specific environment variables. For example, you can use this option to request the default PCL pitch setting.

  PCL is a valid personality. Other personalities, such as POSTSCRIPT, can be added as hardware options. Use the @PJL INFO CONFIG command to request the personalities installed in a particular printer.
- **IPARM :** ***port*** — This optional parameter is used to set port-specific variables. The HP LaserJet 4PJ is the only printer which supports port-specific variables.

  The IPARM : *port* option must be used when setting port-specific variables. Valid values for port for the HP LaserJet 4PJ printer are SERIAL and PARALLEL.
- ***variable*** — This parameter specifies the environment variable about which you are inquiring. For example, the DINQUIRE DENSITY command requests the default toner density setting. See Appendix A for a list of valid variables for each printer. If you require a more detailed description of a particular variable, see the “Environment Variables” section in Chapter 6.

Note The supported variables and range of values for each variable may not be the same in all PJL printer models. See Appendix A for a list of valid variables for each printer, or send the @PJL INFO VARIABLES command to request this information directly from the printer.

- ***value*** — This parameter is the returned value of the requested variable. For example, if you sent the DINQUIRE LOWTONER command, the returned value is either ON or OFF (or CONTINUE/STOP), indicating whether or not you want the printer to stay online when the toner is low. See Appendix A for valid variable values.

Parameters:

Parameter	Variable Names	
personality	PCL	ESCP
	POSTSCRIPT	(other personalities may be supported)
port	PARALLEL	Supported on HP LaserJet 4PJ only
	SERIAL	
variable	Valid variables for each printer are listed in Appendix A.	
value	Acceptable values for each variable are also listed in Appendix A.	

Comments:

If your application has status readback capability, you can request the default setting of any valid environment variable. The returned value indicates the User Default Environment value for the feature. Since the DINQUIRE command returns only the value for one feature, you must send multiple DINQUIRE commands for data about more than one feature.

If the printer does not support the variable, the response is:

```
@PJL DINQUIRE [LPARM:personality | IPARM:port]
↵variable <CR><LF>
"?"<CR><LF>
<FF>
```

If a printer language-specific variable is not available because that printer language is not installed or is invalid, or if a port-specific variable is not available because that port is not supported, the command will return an appropriate error code if USTATUS DEVICE=VERBOSE is enabled.

Note

The LPARM : *personality* option must be used when requesting printer language-specific information.

The IPARM : *port* option must be used when requesting port-specific information.

Example: Using DINQUIRE to Request Feature Settings

This example requests the default settings for resolution and personality. The printer returns values of 600 and AUTO.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Inquiring Default Settings
↵<CR><LF>
@PJL ECHO 08:10:33.7 04-17-93 <CR><LF>
@PJL DINQUIRE RESOLUTION <CR><LF>
@PJL DINQUIRE PERSONALITY <CR><LF>
<ESC>%-12345X
```

For the HP LaserJet 4 printer, a sample response for this example is as follows. Responses from other PJL printers may vary.

```
@PJL ECHO 08:10:33.7 04-17-93<CR><LF>
<FF>
@PJL DINQUIRE RESOLUTION<CR><LF>
600<CR><LF>
<FF>
@PJL DINQUIRE PERSONALITY<CR><LF>
AUTO<CR><LF>
<FF>
```

Example: Using DINQUIRE for Printer Language-Specific Variables

This example requests the default PCL pitch and symbol set using the DINQUIRE command. The printer returns values of 10.00 and ROMAN8.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Inquiring Default PCL Settings
↩<CR><LF>
@PJL ECHO 11:03:05.9 07-04-92 <CR><LF>
@PJL DINQUIRE LPARM : PCL PITCH <CR><LF>
@PJL DINQUIRE LPARM : PCL SYMSET <CR><LF>
<ESC>%-12345X
```

A sample HP LaserJet 4 printer response for this example is as follows. Other PJL printer responses may vary.

```
@PJL ECHO 11:03:05.9 07-04-92<CR><LF>
<FF>
@PJL DINQUIRE LPARM:PCL PITCH<CR><LF>
10.00<CR><LF>
<FF>
@PJL DINQUIRE LPARM:PCL SYMSET<CR><LF>
ROMAN8<CR><LF>
<FF>
```

Related Commands:

INQUIRE, ECHO, INFO, SET, DEFAULT, USTATUS

ECHO Command

The ECHO command prompts the printer to return a specified message to the host computer. Use the ECHO command to synchronize the printer with the host computer to ensure that the status received is the requested status information.

Syntax:

```
@PJL ECHO [<words>] [<CR>]<LF>
```

Response Syntax:

```
@PJL ECHO [<words>] <CR><LF>
<FF>
```

Parameters:

Parameter	Functional Range	Default
<words>	Roman-8 characters 33 – 255, <SP>, <HT>	N/A

- **<words>** — The <words> parameter must begin with a printable character, and can contain any Roman-8 character from 33 through 255, in addition to space characters and horizontal tabs. The <words> parameter is not a string variable, and therefore need not be enclosed in quotation marks. The parameter should be unique, such as the time indicated by the real time clock at the moment the ECHO command is issued. A unique message eliminates the possibility of duplicate messages being echoed by different applications. The maximum length for <words> is 80 bytes.

Comments:

In a multi-user environment, the printer may respond to many different status requests. Since the status messages are buffered in the printer until they are received, the current application may receive status messages that were requested by a previous application. (This happens in situations where the application requests information, or unsolicited status is enabled, and the application closes before receiving the status messages.)

Use the ECHO command to synchronize status so that you know the status you are receiving is the requested status. To do this, send an ECHO command to the printer, and then discard the incoming status messages until your message is echoed back. Eliminate all data received from the printer up to the echoed response string. For the remainder of your print job, you can be sure that all status messages you receive after your echoed message were requested by your application. If you turned on USTATUS, you may receive unsolicited status information at any time.

Example: Using the ECHO Command

This example sends the `Testing 68394 10:57:06.4` message using the ECHO command. After the application receives the `Testing 68394` response, all succeeding solicited messages received during the current job are those requested by the current application.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Using the ECHO command <CR><LF>
@PJL ECHO Testing 68394 10:57:06.4 <CR><LF>
<ESC>%-12345X
```

A sample HP LaserJet 4 printer response for this example is shown below. Other PJL printers may have different responses.

```
@PJL ECHO Testing 68394 10:57:06.4<CR><LF>
<FF>
```

Related Commands:

INQUIRE, DINQUIRE, INFO, SET, DEFAULT, USTATUS

INFO Command

The INFO command requests a specified category of information (see table below). Use this command to find the printer model, configuration, memory available, page count, status information, PJL file system information, and a list of the printer variables, including environmental, printer language-dependent, and unsolicited status variables.

Syntax:

@PJL INFO *category* [<CR>]<LF>

Response Syntax:

@PJL INFO *category*<CR><LF>
[1 or more lines of printable characters or <WS>
followed by <CR><LF>]
<FF>

Parameters:

Category	Description
ID	Provides the printer model number, such as "LaserJet 4."
CONFIG	Provides configuration information, such as how many and which paper sizes are available in this printer.
FILESYS	Returns PJL file system information.
MEMORY	Identifies amount of memory available.
PAGECOUNT	Returns the number of pages printed by the print engine.
STATUS	Provides the current printer status.
VARIABLES	Lists environmental and printer language-dependent variables, the possible variable values, and the current variable settings.
USTATUS	Lists the unsolicited status variables provided by the printer, the possible variable values, and the current variable settings.

Comments:

When the printer receives the INFO command, it returns the requested information. Only one *category* can be used for each INFO command. Each category is described below, with the format of the printer's response. If the printer does not support the specified category, the returned information is as follows:

```
@PJL INFO category  <CR><LF>
"?" <CR><LF>
<FF>
```

ID Category

The INFO ID command provides a way to identify the type of printer used. For the HP LaserJet 4 printer, the INFO ID command prompts the printer to return the following response:

```
@PJL INFO ID<CR><LF>
"LASERJET 4"<CR><LF>
<FF>
```

Note To maintain compatibility with future printers, applications should not use the INFO ID command to identify printer features. Instead, the more detailed INFO CONFIG command should be used (see the following discussion on “The CONFIG Category”).

Some printers, such as the HP LaserJet 4ML printer, return “HP” in front of the model name, for example:

```
@PJL INFO ID<CR><LF>
"HP LASERJET 4ML"<CR><LF>
<FF>
```

CONFIG Category

The INFO CONFIG command returns a series of lines listing configuration information. Use this command to request information such as which printer languages are installed, how many input and output trays are installed, and how many font cartridge slots are in the printer.

Variables appear in the response only if they are installed in the printer. For example, if a HP LaserJet 4 printer does not have the lower paper cassette installed, the INTRAY3 option is not returned in the response.

The general format of the returned information is:

```
@PJL INFO CONFIG<CR><LF>
feature[=value][<value> feature information]<CR><LF>
[<HT>returned option[ attribute]<CR><LF>]
. . .
. . .
feature[=value][<value> feature information]<CR><LF>
[<HT>returned option[ attribute]<CR><LF>]
<FF>
```

The returned information can list multiple features, with the format of the feature information enclosed in brackets. For “[<*value*> *feature information*]”, the square brackets ([ ]) in the format indicate an optional item as well as indicating that brackets enclose the feature information. For example, [4 ENUMERATED] indicates there are 4 returned options for the feature. Refer to the sample printer response in the “Using the INFO CONFIG Command” example for the format of an actual response.

Parameter	Format	Description
feature	alphanumeric value (any combination of letters [ASCII 65-90 or 97-122] and/or digits [ASCII 48-57], beginning with a letter)	Name of a printer feature, such as DUPLEX or FONT CARTRIDGE SLOTS.
value	numeric value	Indicates a feature value, such as MEMORY=500000, or how many and what type of options follow, such as [2 ENUMERATED].
feature information	one or more alphanumeric values, separated by spaces	Indicates what type of information follows, such as RANGE, TABLE ENUMERATED, or READONLY.
returned option	alphanumeric or numeric value, or string	An option of a feature listed in the returned data, such as TIMED, describing a type of USTATUS.
attribute	alphanumeric or numeric value, or string	Adds more information about a particular returned option, such as INTRAY1 *MP*, indicating that tray 1 is a multipurpose (MP) tray.

Example: Using the INFO CONFIG Command

This example requests the current configuration information. The printer, a HP LaserJet 4 printer in this case, responds with a list of features. For example, the returned information shows there is an envelope tray and three input trays: INTRAY1 MP, the multi-purpose tray, INTRAY2 PC, the paper cassette tray, and INTRAY3 LC, the optional lower cassette tray. Other configuration information also is listed, including the total amount of installed memory available and the number of display lines and characters.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Using @PJL INFO CONFIG <CR><LF>
@PJL ECHO 09:51:48.3 12-24-92 <CR><LF>
@PJL INFO CONFIG <CR><LF>
<ESC>%-12345X
```

A sample HP LaserJet 4 printer response for this example is shown on the following page. Other printers may respond differently.

```
@PJL ECHO 09:51:48.3 12-24-92<CR><LF>
<FF>
@PJL INFO CONFIG<CR><LF>
IN TRAYS [3 ENUMERATED]<CR><LF>
      INTRAY1 MP<CR><LF>
      INTRAY2 PC<CR><LF>
      INTRAY3 LC<CR><LF>
ENVELOPE TRAY<CR><LF>
OUT TRAYS [1 ENUMERATED]<CR><LF>
      NORMAL FACEDOWN<CR><LF>
PAPERS [9 ENUMERATED]<CR><LF>
      LETTER<CR><LF>
      LEGAL<CR><LF>
      A4<CR><LF>
      EXECUTIVE<CR><LF>
      MONARCH<CR><LF>
      COM10<CR><LF>
      DL<CR><LF>
      C5<CR><LF>
      B5<CR><LF>
LANGUAGES [2 ENUMERATED]<CR><LF>
      PCL<CR><LF>
      POSTSCRIPT<CR><LF>
USTATUS [4 ENUMERATED]<CR><LF>
      DEVICE<CR><LF>
      JOB<CR><LF>
      PAGE<CR><LF>
      TIMED<CR><LF>
FONT CARTRIDGE SLOTS [1 ENUMERATED]<CR><LF>
      CARTRIDGE<CR><LF>
MEMORY=2097152<CR><LF>
DISPLAY LINES=1<CR><LF>
DISPLAY CHARACTER SIZE=16<CR><LF>
<FF>
```

FILESYS Category

The INFO FILESYS command returns the following information for each volume intialized on the PJL file system:

- Total capacity
- Volume label
- Free space
- Volume read/write status
- Location

Example: Using the INFO FILESYS Command

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Using @PJL INFO FILESYS <CR><LF>
@PJL ECHO 11:33:42.3 9-20-96 <CR><LF>
@PJL INFO FILESYS <CR><LF>
<ESC>%-12345X
```

A sample HP LaserJet 5 printer response for this example is shown below. Other printers may respond differently.

```
@PJL INFO FILESYS [2 TABLE]
VOLUME  TOTAL SIZE  FREE SPACE  LOCATION LABEL  STATUS<CR><LF>
0:    1755136    1718272    <HT>    <HT>      READ-WRITE<CR><LF>
```

If the mass storage device is not present (but the file system firmware is), or if there are not initialized volumes, the reply will be as follows:

```
@PJL INFO FILESYS [1 TABLE]
VOLUME  TOTAL SIZE  FREE SPACE  LOCATION LABEL  STATUS<CR><LF>
<FF>
```

A printer with no file system firmware will treat this command as a PJL INFO command with an unknown category and will respond with the reply:

```
@PJL INFO FILESYS<CR><LF>
"?"<CR><LF>
<FF>
```

MEMORY Category

The INFO MEMORY command returns the total number of bytes of free memory space and the largest free memory block.

Note

To determine the amount of memory available for a particular personality, use the personality command instead of the INFO MEMORY command. For example, to find the amount of memory available for PCL 5, use the Free Space command (<ESC>*s1M). See the *PCL 5 Printer Language Technical Reference Manual* for more information about PCL status readback.

Example: Using the INFO MEMORY Command

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Using @PJL INFO MEMORY <CR><LF>
@PJL ECHO 14:51:48.3 12-18-92 <CR><LF>
@PJL INFO MEMORY <CR><LF>
<ESC>%-12345X
```

A sample HP LaserJet 4 printer response for this example is shown below. Other printers may respond differently.

```
@PJL ECHO 14:51:48.3 12-18-92<CR><LF>
<FF>
@PJL INFO MEMORY<CR><LF>
TOTAL=1494416<CR><LF>
LARGEST=1494176<CR><LF>
<FF>
```

PAGECOUNT Category

The INFO PAGECOUNT returns the number of pages printed by the current print engine. This returned number is an indication of printer usage.

Example: Using the INFO PAGECOUNT Command

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Using PJL INFO PAGECOUNT <CR><LF>
@PJL ECHO 06:53:29.3 1-25-93 <CR><LF>
@PJL INFO PAGECOUNT <CR><LF>
<ESC>%-12345X
```

A sample HP LaserJet 4ML printer response for this example is shown here. Some printers do not return the label “PAGECOUNT=” in front of the page count.

```
@PJL INFO PAGECOUNT<CR><LF>
PAGECOUNT=183933<CR><LF>
<FF>
```

STATUS Category

The INFO STATUS command returns online status (TRUE=online, FALSE=offline), the message currently displayed on the control panel, and a status code. In the following example, the status code is 10001, which means the printer is ready. (See Appendix D for a list of all printer status codes.)

Only the "string" portion of the "DISPLAY =" status message is localized; the same message as that displayed on the control panel appears in whichever language is used.

Note For those printers supporting Japanese printing, when the language is set to Japanese, strings which correspond to a control panel message are displayed on the control panel using the JIS X0201-76 character set.

Example: Using the INFO STATUS Command

This example requests status information. The printer, in this case a HP LaserJet 4 printer, returns a status code (10001), the message displayed on the control panel (00 READY), and the online status (ONLINE=TRUE).

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Using @PJL INFO STATUS <CR><LF>
@PJL ECHO 17:45:22.5 05-17-92 <CR><LF>
@PJL INFO STATUS <CR><LF>
<ESC>%-12345X
```

A sample HP LaserJet 4 printer response for this example is shown here. Other PJL printers may produce a different response.

```
@PJL ECHO 17:45:22.5 05-17-92<CR><LF>
<FF>
@PJL INFO STATUS<CR><LF>
CODE=10001<CR><LF>
DISPLAY="00 READY"<CR><LF>
ONLINE=TRUE<CR><LF>
<FF>
```

VARIABLES Category

The INFO VARIABLES command returns a list of the environment and printer language-dependent variables. Use this command to find a list of the variables, the current setting for each, and the possible values.

The set of printer language-specific variables returned by the printer depends on the current environment and the printer languages installed. Each add-on printer language has its own specific variables. Printer language-specific variables are always indicated by LPARM:*personality* in the response. Port-specific variables (HP LaserJet 4PJ only) are always indicated by IPARM:*port* in the response.

One portion of the returned information is a list of font sources (see the following example). This list varies depending on which font sources, such as ROM SIMMs and cartridges, are installed. Only those font sources which are installed and contain valid fonts appear on the list. For example, the **S** option appears only if one or more permanent soft fonts currently exist.

The FONTNUMBER range lists the range of fonts for the current font source only. The lower limit is 0 if the current font source contains a default-marked font; otherwise the lower limit is 1. The upper range limit varies depending on how many fonts are in the current font source.

Note For information about any of the environment variables listed by the INFO VARIABLES command, see the "PJL Environment Variables" section in Chapter 6.

Example: Using the INFO VARIABLES Command

This example uses the INFO VARIABLES command to obtain a list of the environment variables. The returned information lists the environment variables, the current setting, and the value or range of values for each. For example, the RESOLUTION section indicates the current setting is 600, and that there are two possible choices: 300 and 600.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Using the @PJL INFO <CR><LF>
@PJL COMMENT VARIABLES Command <CR><LF>
@PJL ECHO 07:22:03.8 12-03-92 <CR><LF>
@PJL INFO VARIABLES <CR><LF>
<ESC>%-12345X
```

A sample HP LaserJet 4 printer response for this example is shown below. Other PJL printers may provide a somewhat different response:

```
@PJL ECHO 07:22:03.8 12-03-92<CR><LF>
<FF>
@PJL INFO VARIABLES
COPIES=1 [2 RANGE]
      1
      999
PAPER=LETTER [9 ENUMERATED]
      LETTER
      LEGAL
      A4
      . . .
      B5
ORIENTATION=PORTRAIT [2 ENUMERATED]
      PORTRAIT
      LANDSCAPE
FORMLINES=60 [2 RANGE]
      5
      128
MANUALFEED=OFF [2 ENUMERATED]
      OFF
      ON/
```

```
RET=MEDIUM [4 ENUMERATED]
      OFF
      LIGHT
      MEDIUM
      DARK
PAGEPROTECT=OFF [4 ENUMERATED]
      OFF
      LETTER
      LEGAL
      A4
RESOLUTION=600 [2 ENUMERATED]
      300
      600
PERSONALITY=AUTO [3 ENUMERATED]
      AUTO
      PCL
POSTSCRIPT
      TIMEOUT=15 [2 RANGE]
      5
      300
MPTRAY=CASSETTE [3 ENUMERATED]
      MANUAL
      CASSETTE
      FIRST
INTRAY1=UNLOCKED [2 ENUMERATED]
      UNLOCKED
      LOCKED
INTRAY2=UNLOCKED [2 ENUMERATED]
      UNLOCKED
      LOCKED
INTRAY3=UNLOCKED [2 ENUMERATED]
      UNLOCKED
      LOCKED
CLEARABLEWARNINGS=ON [2 ENUMERATED READONLY]
      JOB
      ON
AUTOCONT=OFF [2 ENUMERATED READONLY]
      OFF
      ON
```

```
DENSITY=3 [2 RANGE READONLY]
      1
      5
LOWTONER=ON [2 ENUMERATED READONLY]
      OFF
      ON
INTRAY1SIZE=LETTER [9 ENUMERATED READONLY]
      LETTER
      LEGAL
      A4
      EXECUTIVE
      COM10
      MONARCH
      C5
      DL
      B5
INTRAY2SIZE=LETTER [4 ENUMERATED READONLY]
      LETTER
      LEGAL
      A4
      EXECUTIVE
INTRAY3SIZE=LETTER [4 ENUMERATED READONLY]
      LETTER
      LEGAL
      A4
      EXECUTIVE
INTRAY4SIZE=COM10 [5 ENUMERATED READONLY]
      COM10
      MONARCH
      C5
      DL
      B5
LPARM:PCL FONTSOURCE=I [1 ENUMERATED]
      I
LPARM:PCL FONTNUMBER=0 [2 RANGE]
      0
      50
LPARM:PCL PITCH=10.00 [2 RANGE]
      0.44
      99.99
```

```
LPARM:PCL PTSIZE=12.00 [2 RANGE]
      4.00
      999.75
LPARM:PCL SYMSET=ROMAN8 [31 ENUMERATED]
      ROMAN8
      ISOL1
      ISOL2
      . . .
      . . .
      WIN30
LPARM:POSTSCRIPT PRTPSERRS=OFF [2 ENUMERATED]
      OFF
      ON
<FF>
```

USTATUS Category

The INFO USTATUS command lists each type of unsolicited status supported by the printer, such as DEVICE, JOB, PAGE, and TIMED (see the “USTATUS Command” discussion on the next page for information about unsolicited status). The listing also contains the current setting and the possible values for each type of status. For more information concerning the different types of unsolicited status, see the “USTATUS Command” section later in this chapter.

Example: Using the INFO USTATUS Command

This example requests information about the unsolicited status variables. These are variables that can be used in the USTATUS command. In this example, the HP LaserJet 4 printer replies that there are 4 unsolicited status types: DEVICE, JOB, PAGE, and TIMED. The current setting for each type of unsolicited status is given, along with the possible variable values (for instance, OFF, ON, and VERBOSE for device status).

```
<ESC>%-12345X@PJL <CR><LF>
@PJL ECHO 08:10:09.1 08-22-92 <CR><LF>
@PJL INFO USTATUS <CR><LF>
<ESC>%-12345X
```

A sample HP LaserJet 4 printer response for this example is shown below. Responses for other PJL printers may vary.

```
@PJL ECHO 08:10:09.1 08-22-92<CR><LF>
<FF>
@PJL INFO USTATUS<CR><LF>
DEVICE=OFF [3 ENUMERATED]<CR><LF>
      OFF<CR><LF>
      ON<CR><LF>
      VERBOSE<CR><LF>
JOB=OFF [2 ENUMERATED]<CR><LF>
      OFF<CR><LF>
      ON<CR><LF>
PAGE=OFF [2 ENUMERATED]<CR><LF>
      OFF<CR><LF>
      ON<CR><LF>
TIMED=0 [2 RANGE]<CR><LF>
      5<CR><LF>
      300<CR><LF>
<FF>
```

Related Commands:

INQUIRE, ECHO, SET, DEFAULT, USTATUS

USTATUS Command

The USTATUS command is used to enable or disable unsolicited printer status. Unlike the status information solicited by sending the INQUIRE, DINQUIRE, or INFO commands, unsolicited status is sent automatically when the status changes. Use the USTATUS command when you want to know:

- Device status changes (such as printer open, paper jams, and paper out conditions)
- Job status changes (when a JOB command is encountered, the job completely prints, or the job is canceled)
- Page status changes (when each printed page reaches the output tray)
- Timed status (periodic status report at a specified time interval)

Note Unlike solicited status, the USTATUS command does not have an immediate response. Instead, unsolicited status messages are sent only when the printer status changes.

Syntax:

```
@PJL USTATUS variable = value [<CR>]<LF>
```

Status Message Syntax:

```
@PJL USTATUS variable <CR><LF>
[1 or more lines of printable characters or <WS>
followed by <CR><LF>]
<FF>
```

Parameters:

Variable	Value	Description
DEVICE	ON	Enables unsolicited device status for all status changes (see the “DEVICE Variable” description below)
	VERBOSE	Enables unsolicited device status for all status changes plus notification of all PJL parser warnings and errors. The VERBOSE value should only be used during application development.
	OFF	Disables unsolicited device status
JOB	ON	Enables unsolicited job status so that the printer sends a status message every time a job begins, ends, or is canceled
	OFF	Disables unsolicited job status
PAGE	ON	Enables unsolicited page status so that the printer sends a status message every time a page reaches the output tray
	OFF	Disables unsolicited page status
TIMED	5 to 300	Enables timed unsolicited status so that the printer automatically sends status at a specified time increment (in seconds)
	0	Turns TIMED USTATUS off

Comments:

Unsolicited status allows you to automatically receive device, job, page, or timed status without requesting it. Each type of unsolicited status provides different information and is described on the following pages.

Some printer models may have more (or fewer) types of unsolicited status than DEVICE, JOB, PAGE, and TIMED. You can have the printer list the various types of unsolicited status by issuing the INFO USTATUS command. See “Example: Using the INFO USTATUS Command” for an example of this.

Unsolicited status, except for TIMED, can be turned off individually using the OFF parameter, such as in the USTATUS JOB=OFF command. TIMED status is turned off by setting it to zero. Alternatively, all unsolicited device status can be turned off using the USTATUSOFF command.

DEVICE Variable

The USTATUS DEVICE = *value* command prompts the printer to send status messages when device changes occur. When DEVICE = ON, the printer sends status information for all changes to printer status. When DEVICE = VERBOSE, the printer also sends status information for all PJL parser warnings and errors.

Part of the unsolicited status message sent to the host is a 5-digit code that indicates the status condition. The first 2 digits divide the status codes into different categories. The general status categories are listed in the following table. (This is only a general summary of the specified categories. The full status code listing is located in Appendix D.)

If there is a “DISPLAY=*string*” portion of the status message, the string is localized; the same message as that displayed on the control panel appears in whichever language is being used.

Note For those printers supporting Japanese printing, when the language is set to Japanese, strings which correspond to a control panel message are displayed on the control panel using the JIS X0201-76 character set.

Status Category	Description
10 (10-000 to 10-999)	Informational messages which do not indicate errors, such as “Device was put online and is ready” or “device was put offline.”
11 (11-000 to 11-999)	These messages indicate background paper mount messages, which means one of the available paper input sources is empty, but another paper source is available and loaded with the correct paper size. The printer remains online during background paper mount conditions.
12 (12-000 to 12-999)	Messages indicating background paper tray status, such as “tray open” or “tray lifting”. The printer remains online during background paper tray status conditions.
15 (15-000 to 15-999)	These messages indicate output bin status, such as “output bin full.” The printer goes offline when the output bin is full.
20 (20-000 to 20-999)	This type of message denotes a PJL parser error. When this type of error occurs, the entire command line is ignored.
25 (25-000 to 25-999)	These messages are PJL parser errors. When this type of message occurs, only part of the PJL command is ignored, instead of the whole command as happens with 20-xxx errors.
27 (27-000 to 27-999)	These messages are PJL semantic errors, indicating the command syntax is acceptable, but command execution is not possible for some reason. A situation that produces a semantic error is trying to lock a paper tray when all other paper trays are already locked.
30 (30-000 to 30-999)	Most conditions in this category are auto-continuable, indicating that if no operator action is taken, the printer automatically continues if the auto-continue feature is set to true; if auto-continue is set to false, the printer waits until an operator presses either the Continue or On Line key. Examples of these errors include non-fatal I/O errors or when a page is ejected because it is too complex to format without the page protection feature enabled.
32 (32-000 to 32-999)	These conditions indicate PJL file system errors and their corresponding error codes and control panel display strings.

Status Category	Description
35 (35-000 to 35-999)	Messages indicating that operator intervention *may* be required. The printer stays online and continues printing, with the potential for reduced capability. Data may be lost.
40 (40-000 to 40-999)	Messages indicating that operator intervention is required. Printing halts until the condition is resolved. Examples include paper jam, out of paper, and printer open conditions.
41 (41-000 to 41-999)	This category of messages indicates a foreground paper mount. These conditions occur when paper is out and there is no alternate paper source available that is loaded with the correct paper size. The printer is offline under these conditions.
42 and 44 (42-000 to 44-999)	These status codes indicate paper jam errors and their associated error codes and control panel display strings.
43 (43-000 to 43-999)	Messages indicating PJL error codes and corresponding control panel display strings for optional (external) paper handling devices.
50 (50-000 to 50-999)	Hardware errors. Examples include memory errors and fatal print engine errors.

Using Unsolicited Device Status

The following example enables unsolicited status with the verbose option. The printer response indicates that the printer is open.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL USTATUS DEVICE = VERBOSE<CR><LF>
<ESC>%-12345X
```

A sample HP LaserJet 4 printer response for unsolicited device status is shown here. For other printers, responses may vary.

```
@PJL USTATUS DEVICE<CR><LF>
CODE=40021<CR><LF>
DISPLAY="12 PRINTER OPEN"<CR><LF>
ONLINE=FALSE<CR><LF>
<FF>
```

JOB Variable

The USTATUS JOB = ON command is used to notify the application every time a JOB command is encountered, when the final page of a job is in the output tray and an EOJ command has been received, and when a job has been canceled (only for those printers that support job cancellation such as the HP LaserJet 4000 series and 5000 series printers). This is useful for spooling applications requiring feedback indicating that a particular job has started or completely printed.

If job status is enabled and the printer receives a JOB command, it resets the page count associated with the unsolicited page status and returns a job status message.

Note Resetting the page count associated with unsolicited page status affects only future pages. Pages that are already processed, but not yet printed, are not affected.

The PAGES=*number of pages* information associated with unsolicited EOJ status indicates the number of pages printed on paper. It does not include any page images that were processed in non-printing mode (see the “PAGE Variable” discussion.) When in the duplex mode, each side of a duplex page counts as one page.

Note Some HP LaserJet printers support job cancellation. For information about unsolicited job status during job cancellation, see the “Job Cancellation” section in Chapter 5.

Example: Using Unsolicited Job Status

This example turns on unsolicited job status so that the spooler can be notified when the job starts and completely finishes. A job name is included so that the spooler can match the status information with the correct job. (The indented lines indicate a job sent to the spooler from another application.)

```
<ESC>%-12345X@PJL <CR><LF>
@PJL USTATUS JOB = ON <CR><LF>
@PJL JOB NAME = "JOB 14993" <CR><LF>
     <ESC>%-12345X@PJL <CR><LF>
     @PJL ENTER LANGUAGE = PCL <CR><LF>
     <ESC>E . . . PCL Job . . . <ESC>E
     ↵<ESC>%-12345X
↵<ESC>%-12345X@PJL <CR><LF>
@PJL EOJ NAME = "JOB 14993" <CR><LF>
<ESC>%-12345X
```

A sample unsolicited HP LaserJet 4 printer response for this example is as shown here. For other printers, the response may be different.

```
@PJL USTATUS JOB<CR><LF>
START<CR><LF>
NAME="JOB 14993"<CR><LF>    (from the JOB command)
<FF>

[ . . time period while job is printing . . .]

@PJL USTATUS JOB<CR><LF>
END<CR><LF>
NAME="JOB 14993"<CR><LF>    (from the EOJ command)
PAGES=3<CR><LF>
<FF>
```

The printer sends the unsolicited status associated with the JOB command when the JOB command is parsed. The printer sends the unsolicited status associated with the EOJ command when all of the pages received before the EOJ command have been printed. To maximize performance, HP printers start processing the next job before the last page of the current job has been printed. Therefore, the printer may return unsolicited JOB and EOJ status messages in an order different than sent by the application or spooler. For example, when printing two consecutive jobs, the unsolicited EOJ status message associated with the first job may not arrive at the host until after the JOB status message of the second job.

PAGE Variable

The USTATUS PAGE = ON command is used to notify the application that a particular page finished printing. This is useful for applications such as spoolers, where it is beneficial to monitor the job on a page-by-page basis. For job recovery, described later in this chapter, it is helpful to know which pages are completely printed.

The number of pages is incremented by one for each simplex page formatted, and by two for each duplex page formatted. The page count includes all pages printed and all pages processed in non-printing mode since the last JOB or EOJ command. (This is different than the PAGES = *page count* returned with the unsolicited JOB status, which does not include pages processed in non-printing mode.)

Example: Using Unsolicited Page Status

The following example enables unsolicited page status. The sample HP LaserJet 4 printer response indicates the status messages that the printer sends when processing a four-page job.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL USTATUS PAGE = ON <CR><LF>
@PJL JOB <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E . . . Four-page PCL Job . . . <ESC>E
↩<ESC>%-12345X@PJL <CR><LF>
@PJL EOJ <CR><LF>
<ESC>%-12345X
```

A sample HP LaserJet 4 printer response for unsolicited page status is shown here. Other PJL printer responses may vary.

```
@PJL USTATUS PAGE<CR><LF>
1<CR><LF>
<FF>
@PJL USTATUS PAGE<CR><LF>
2<CR><LF>
<FF>
@PJL USTATUS PAGE<CR><LF>
3<CR><LF>
<FF>
@PJL USTATUS PAGE<CR><LF>
4<CR><LF>
<FF>
```

TIMED Variable

The TIMED variable allows "automatic polling" of the printer without host intervention and without exiting the current printer language (back to PJL). Values from 5 to 300 indicate the time interval between status messages in seconds. This feature is turned off by setting the value to 0. The status message returned when this command is enabled is similar to that solicited by the INFO STATUS command.

Note The accuracy of the timer may vary +/– 10% due to delays in data transmission and other system variables. To allow for this use a timing window in your application.

The "CODE=" portion indicates a status code number. See Appendix D for a complete list of status code numbers. The "DISPLAY=" portion of the returned status indicates the message currently displayed on the control panel. The "ONLINE=" portion indicates whether the printer is online or offline.

Note The "*string*" portion of the "DISPLAY=*string*" status message is localized; the same message displayed on the control panel appears in whichever language is being used.

For those printers supporting Japanese printing when the language is set to Japanese strings which correspond to a control panel message are displayed on the control panel using the JIS X0201-76 character set.

Example: Using Timed Unsolicited Status

In this example a status message is sent to the host every 30 seconds.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL USTATUS TIMED = 30 <CR><LF>
<ESC>%-12345X
```

A sample HP LaserJet 4 printer response is shown below. Other PJL printers may respond differently.

```
@PJL USTATUS TIMED<CR><LF>
CODE=10001<CR><LF>
DISPLAY="00 READY"<CR><LF>
ONLINE=TRUE<CR><LF>
<FF>
```

Related Commands:

INFO, ECHO, INQUIRE, DINQUIRE, SET, USTATUSOFF

USTATUSOFF Command

The USTATUSOFF command turns off all unsolicited status. This command eliminates the need to send several commands to turn off different types of USTATUS.

Syntax:

```
@PJL USTATUSOFF [<CR>]<LF>
```

Parameters:

There are no parameters for this command.

Example: Using the USTATUSOFF Command

This example uses the USTATUSOFF command to disable all unsolicited status before specifying the desired unsolicited status, which in this case is DEVICE status.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL USTATUSOFF <CR><LF>
@PJL USTATUS DEVICE = ON <CR><LF>
<ESC>%-12345X
```

Related Commands:

USTATUS

Job Recovery

PJL provides job recovery capability using the following combination of commands:

- The JOB and EOJ commands are used to reset the page count and inform the printer of the boundaries for the job—its beginning and end.
- The USTATUS PAGE command is used to determine how many pages are completely printed.

If you must reprint a portion of a job, the spooling application can re-issue the job using the START option to specify the remaining portion of the job.

The following PJL job shows an example that provides job recovery if a problem occurs. Notice that the USTATUS JOB and USTATUS PAGE commands are sent prior to the JOB command. If a power failure or another problem interrupts the job, the unsolicited page status indicates the last completely printed page.

Note The USTATUS JOB command is not strictly required for job recovery. However, it is useful for tracking jobs by name, not just page number. The following example uses the command to show the difference between the page count returned by the unsolicited job status and the unsolicited page status.

Sending the Initial Job

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Providing for Recovery <CR><LF>
@PJL USTATUS JOB = ON <CR><LF>
@PJL USTATUS PAGE = ON <CR><LF>
@PJL JOB NAME = "1st Shot" <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E ... 100-page PCL job ... <ESC>E
↵<ESC>%-12345X@PJL <CR><LF>
@PJL EOJ NAME = "End of 1st Shot" <CR><LF>
<ESC>%-12345X
```

After Job Failure

Once the spooler senses that the job failed (in this case, due to a power failure), the job can be recovered by resending it using the JOB command with the START option. Set the page number in the START option to the number of the last page printed plus 1. For instance, in the previous example, if a power failure occurred after page 25 completely printed, you set the START option to start printing on page 26 (see below). In this case, the printer processes the first 25 pages in non-printing mode, and then prints from page 26 through the end of the job.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Recovering Crashed Job <CR><LF>
@PJL USTATUS JOB = ON <CR><LF>
@PJL USTATUS PAGE = ON <CR><LF>
@PJL JOB NAME = "2nd Try" START = 26 <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E ...Same 100-page PCL job ...<ESC>E
↵<ESC>%-12345X@PJL <CR><LF>
@PJL EOJ NAME = "End of Recovery" <CR><LF>
<ESC>%-12345X
```

In the job above, the first unsolicited page status message is sent after page 26 lands in the output tray. For an HP LaserJet 4 printer, the response appears as shown below. Other PJL printers may respond differently.

```
@PJL USTATUS PAGE<CR><LF>
26<CR><LF>
<FF>
```

Additional page status messages are sent after each succeeding page lands in the output tray. After the remaining 75 pages of the job are completely printed the host receives unsolicited page and job status as follows:

```
@PJL USTATUS PAGE<CR><LF>
100<CR><LF>
<FF>
@PJL USTATUS JOB<CR><LF>
END<CR><LF>
NAME="End of Recovery"<CR><LF>
PAGES=75<CR><LF>
<FF>
```

The unsolicited *page* status indicates that the 100th page printed (25 processed in non-printing mode and 75 printed pages). The *job* status indicates that the EOJ command was received and that 75 pages were printed in the recovery job.

8 Device Attendance Commands

Introduction

PJL enables you to change messages displayed on the printer control panel. This capability is useful for alerting operators to perform specific actions, such as loading paper or pressing keys. This chapter describes the following three device attendance commands:

- RDYMSG specifies a "ready message" that replaces the "00 READY" message on the printer control panel. The RDYMSG command does not affect the online state.
- OPMSG displays a specified "operator message" on the printer control panel and takes the printer offline.
- STMSG displays the specified "status message" on the printer control panel and takes the printer offline. It returns the name of the key that the operator pressed to put the printer back online.

Note Some PJL printers do not support the device attendance commands. See Appendix A for a list of features supported by each printer.

Note For information about products newer than those included in this book, see the *Printer Job Language Technical Reference Addendum*, which includes product-specific information about newer products, as well as commands and variables added to PJL to support these newer products.

RDYMSG Command

The RDYMSG command replaces the control panel's “ready” message with the specified message. Use the RDYMSG command to modify the displayed message while keeping the printer online.

Syntax:

```
@PJL RDYMSG DISPLAY = "message" [<CR>]<LF>
```

Parameters:

Parameter	Functional Range	Default
DISPLAY = "*message*"	Roman-8 characters 33 and 35 thru 255, <SP>	N/A

- **DISPLAY = "*message*"** — The variable *message* can be any combination of printable characters (except quotation marks, character 34) and spaces, with a limit of 1 line of 16 characters (see “Comments” below). The *message* variable is a string and must be enclosed in double quotes as shown in the command syntax.

Comments:

Since the RDYMSG command leaves the printer online, it can be used to display the name of the person printing the current job, or other pertinent information, while a job is printing. It also can be used in network environments to display the name of the printer.

Note

For the HP LaserJet 4000, 5000, 8000, 8100, Color LaserJet 4500, and 8500 printers (and newer), use the `JOB DISPLAY="`*`display text`*`"` method to display a message on the front panel during a specific job. For these printers, RDYMSG only replaces the lowest priority message, which is typically only the READY message.

The command @PJL RDYMSG DISPLAY = "" (or performing a Menu Reset—“09 Menu Reset”) returns the display to the normal ready message.

Note

This command replaces the lowest priority 00 READY message. If any higher priority message is displayed (for example, toner low), the new ready message does not appear until these outstanding conditions are cleared.

For HP LaserJet 4PJ, 4V, 4MV, 5Si, 5SiMx, and 5Si Mopier printers, if the LANG variable is set to Japanese, the message is displayed using the JIS X0201-76 character set.

For the LaserJet 4000, 5000, 8000, and 8100 series printers, if LANG is set to POLISH, CZECH, or HUNGARIAN, messages are displayed using the Latin 2 (ISO 8859/2) character set. If LANG is RUSSIAN, messages are displayed using Cyrillic (ISO 8859/5). For LANG=TURKISH, the display is in Latin 5 (ISO 8859/9). This is also true for the HP Color LaserJet 4500 printer, except there is no support for Turkish or Hungarian on this printer.

Some HP LaserJet printers may have a different limit for the number of display lines and number of display characters. To request the display limits, use the INFO CONFIG command. When this command is used, the printer returns DISPLAY LINES=*value* and DISPLAY CHARACTER SIZE=*value* as part of the response message. For example, HP LaserJet 4 and 4M printers return DISPLAY LINES=1, DISPLAY CHARACTER SIZE=16, indicating that the displayed message is limited to 1 line of 16 characters.

Example: Using the RDYMSG Command

This example simulates a spooler that prints a job from another application. The spooler uses the RDYMSG command to display the name of the person printing the job (while the job is printing).

Note

In the example below, the @PJL JOB DISPLAY command has been added to display the job name on the newer printers. (See the note on page 8-2.)

After the job is printed, the spooler restores the normal ready message. (The indented command lines indicate those sent by the printing application; the remaining lines are sent by the spooler.)

```
<ESC>%-12345X@PJL <CR><LF>
@PJL JOB NAME = "Terry's Job" <CR><LF>
@PJL JOB DISPLAY = "Terry's Job" <CR><LF>
@PJL RDYMSG DISPLAY = "TERRY'S JOB" <CR><LF>
  <ESC>%-12345X@PJL <CR><LF>
  @PJL ENTER LANGUAGE = PCL <CR><LF>
  <ESC>E . . . PCL Job . . .<ESC>E
  ↵<ESC>%-12345X
↵<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Restore READY message <CR><LF>
@PJL RDYMSG DISPLAY = "" <CR><LF>
@PJL EOJ NAME = "End of Terry's Job" <CR><LF>
<ESC>%-12345X
```

Related Commands:

OPMSG, STMSG, INFO CONFIG

OPMSG Command

The OPMSG command prompts the printer to display the specified message and go offline. Use this command to display a message and halt printing until the operator presses the On Line, Continue, or Reset key.

Syntax:

```
@PJL OPMSG DISPLAY = "message" [<CR>]<LF>
```

Parameters:

Parameter	Functional Range	Default
DISPLAY = "*message*"	Roman-8 characters 33 and 35 – 255, <SP>,<HT>	N/A

- **DISPLAY = "*message*"** — The variable *message* can be any combination of printable characters (except quotation marks, character 34) and spaces or horizontal tab characters, with a limit of 1 line of 16 characters (see “Comments” below). The *message* variable is a string and must be enclosed in quotation marks as shown in the command syntax.

Comments:

On some HP printers, the first two display characters blink. To avoid blinking, begin the message with two blank spaces.

Some HP LaserJet printers may have a different limit for the number of display lines and number of display characters. To request the display limitations, use the INFO CONFIG command. The printer returns DISPLAY LINES=*value* and DISPLAY CHARACTER SIZE=*value* as part of the response message. For example, the HP LaserJet 4 and 4M printers return DISPLAY LINES=1, DISPLAY CHARACTER SIZE=16, indicating that the displayed message is limited to 1 line of 16 characters.

Note For HP LaserJet 4PJ, 4V, 4MV, 5Si, 5SiMx, 5Si Mopier printers, if the LANG variable is set to Japanese, the message is displayed in the JIS X0201-76 character set.

For the LaserJet 4000, 5000, 8000, and 8100 series printers, if LANG is set to POLISH, CZECH, or HUNGARIAN, messages are displayed using the Latin 2 (ISO 8859/2) character set. If LANG is RUSSIAN, messages are displayed using Cyrillic (ISO 8859/51). For LANG=TURKISH, the display is in Latin 5 (ISO 8859/9). This is also true for the HP Color LaserJet 4500 printer, except there is no support for Turkish or Hungarian on this printer.

Example: Using the OPMSG Command

This example displays “LOAD LETTERHEAD” on the printer control panel and halts processing until the operator presses the On Line or Continue key. Once one of the keys is pressed, the first page is printed. Then “LOAD PLAIN PAPER” is displayed. When the On Line or Continue key is pressed, the printer prints the rest of the job.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL JOB NAME = "JOB 111753" <CR><LF>
@PJL OPMSG DISPLAY = "LOAD LETTERHEAD"<CR><LF>
@PJL <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E This is "Letterhead"(page 1)<ESC>E
↵<ESC>%-12345X@PJL <CR><LF>
@PJL EOJ NAME = "EOJ 111753" <CR><LF>
<ESC>%-12345X
```

Related Commands:

RDYMSG, STMSG, INFO CONFIG

STMSG Command

The STMSG command prompts the printer to display the specified message, go offline, and return a status message indicating which key the operator pressed to return the printer online. Use this command to display a customized message, to halt printing until the operator presses the On Line, Continue, or Reset key, and to take a different action depending on which key the user presses.

Syntax:

```
@PJL STMSG DISPLAY = "message" [<CR>]<LF>
```

Return Syntax:

```
@PJL STMSG DISPLAY="message" <CR><LF>
key <CR><LF>
<FF>
```

Parameters:

Parameter	Functional Range	Default
DISPLAY = "*message*"	Roman-8 characters 33 and 35 – 255, <SP>,<HT>	N/A
key	ONLINE, RESET, CONTINUE, or JOBCANCEL	N/A

- **DISPLAY = "*message*"** — The variable *message* can be any combination of printable characters (except quotation marks, character 34) and spaces or horizontal tab characters, with a limit of 1 line of 16 characters (see comments below). The *message* variable is a string and must be enclosed in double quotes as shown in the command syntax.
- ***key*** — This variable is returned with the status response after the operator presses one of three control panel keys. The *key* variable has a value of either ONLINE, RESET, JOBCANCEL or CONTINUE, depending on which key the operator presses to return the printer online.

Note For HP LaserJet 4PJ, 4V, 4MV, 5Si, 5SiMx, 5Si Mopier printers, if the LANG variable is set to Japanese, messages are displayed using the JIS X0201-76 character set.

For the LaserJet 4000, 5000, 8000, and 8100 series printers, if LANG is set to POLISH, CZECH, or HUNGARIAN, messages are displayed using the Latin 2 (ISO 8859/2) character set. If LANG is RUSSIAN, messages are displayed using Cyrillic (ISO 8859/5). For LANG=TURKISH, the display is in Latin 5 (ISO 8859/9). This is also true for the HP Color LaserJet 4500 printer, except there is no support for Turkish or Hungarian on this printer.

Comments:

This command is useful for making a programming decision based on which key the operator presses. For example, the application can prompt the user to press Reset, and then wait until the Reset key is pressed.

Some HP LaserJet printers may have a different limit for the number of display lines and number of display characters. To request the display limits, use the INFO CONFIG command. The printer returns DISPLAY LINES=*value* and DISPLAY CHARACTER SIZE=*value* as part of the response message. For example, HP LaserJet 4 and 4M printers return DISPLAY LINES=1, DISPLAY CHARACTER SIZE=16, indicating that the displayed message is limited to 1 line of 16 characters.

Example: Using the STMSG Command

This example prompts the printer to display “LOAD FORM 1040” and goes offline. The printer returns the name of the key that is pressed to resume operation—in this case, the Continue key.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL <CR><LF>
@PJL STMSG DISPLAY = "LOAD FORM 1040" <CR><LF>
@PJL <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E . . PCL job . .<ESC>E<ESC>%-12345X
```

The returned message, if the operator presses the Continue key, is:

```
@PJL STMSG DISPLAY="LOAD FORM 1040"
CONTINUE
<FF>
```

Related Commands:

OPMSG, RDYMSG, INFO CONFIG

9 PJL File System Commands

Introduction

Several HP LaserJet printers have mass storage capabilities for storing fonts, macros, electronic forms, and other information. Printers such as the HP LaserJet 4000 and 5000 series printers have an optional disk drive. The HP LaserJet 4000, 5000 series and some other printers support flash memory, which is non-volatile memory contained in modules that are inserted into the printer's SIMM/DIMM slots. Preferably, the printer's mass memory is managed by a host-based mass storage application that supports interaction between host software and the printer disk and/or flash memory. However, users in some environments might not have a mass storage management application. The PJL file system commands described in this chapter are provided in order to make use of printer- based mass storage when a mass storage management application is not available. The PJL file system commands described in this chapter are used the same on both types of printer mass storage (printer disk drive and flash memory).

Note For information about creating a host-based mass storage management application, contact your HP support representative.

Note For information about products newer than those included in this book, see the *Printer Job Language Technical Reference Addendum*, which includes product-specific information about newer products, as well as commands and variables added to PJL to support these newer products.

The PJL file system consists of eight commands:

- FSAPPEND
- FSDELETE
- FSDIRLIST
- FSDOWNLOAD
- FSINIT
- FSMKDIR
- FSQUERY
- FSUPLOAD

These commands are described on the following pages. For feature support information, see Appendix A.

FSAPPEND Command

The FSAPPEND command appends data to an existing file, or if the file doesn't exist, creates the file and loads it with the given data.

Syntax:

```
@PJL FSAPPEND FORMAT:BINARY SIZE=integer
↲NAME = "pathname" [<CR>]<LF>
<binary data><ESC>%-12345X
```

Parameters:

Parameter	Functional Range	Default
SIZE=*integer*	0 to $2^{31} - 1$	N/A
NAME = "*pathname*"	Roman-8 characters 01 thru 255	N/A

- **SIZE = *integer*** — The size variable indicates the number of bytes in the file to be appended. The size indicates the number of bytes immediately following the <LF> to the next UEL command.
- **NAME = "*pathname*"** — The variable *pathname* is similar to an MS-DOS filename, except it is not limited to eight characters and a three-character extension. The pathname may contain up to 100 Roman-8 characters per *item* in the range 01 through 255, but the first and last characters must not be a space character (character 32), or character 229. Each *item* is delimited by the backslash " \ " character. If more than one backslash character is used (such as \\\\ ), the file system treats it as one backslash. The maximum number of characters in a pathname is 255; the maximum number of items is 9. The volume of the PJL file system is required in the pathname (the volume range is 0, 1, and 2, depending on the printer [prior to LaserJet 4000, the only valid volume was 0] — see the examples on the following page).

Note For the FSAPPEND command, the pathname must be a file (not a directory).

Examples of valid pathnames include:

0:	Volume 0
0:\	Root directory on volume 0
0:\MyDir	*MyDir* directory
0:\My/Dir\Gen/Dir	*Gen/Dir* directory in *My/Dir* directory
0:\dir0\file1	*file1* file in *dir0* directory
0:\DIR1\DIR2\File1	*File1* file in *DIR2* directory in *DIR1* directory
0:\DIR1\Prefix/Suffix	*Prefix/Suffix* file in *DIR1* directory

- ***<binary data>*** — This is the binary file data to be appended or used to create a new file.

Example: Using the FSAPPEND Command

This example demonstrates using the FSAPPEND command to append a file.

```
@PJL FSAPPEND FORMAT:BINARY
↪NAME = "0:\pcl\macros\OurLogo"
↪SIZE = 35<CR><LF>
35 bytes of macro data<ESC>%-12345X
```

Related Commands:

FSDELETE, FSDIRLIST, FSDOWNLOAD, FSINIT, FSMKDIR, FSQUERY, FSUPLOAD

FSDIRLIST Command

The FSDIRLIST command returns a list of files and directories which exist within the specified directory on the printer's file system. This command is similar in function to the DOS DIR command. The ENTRY and COUNT parameters are used to limit the amount of data returned to the host.

Syntax:

```
@PJL FSDIRLIST NAME = "pathname"
↵ENTRY=integer COUNT=integer[<CR>]<LF>
```

Response Syntax:

```
@PJL FSDIRLIST NAME = "pathname"
↵ENTRY=integer[<CR>]<LF>
filename TYPE=FILE SIZE=integer<CR><LF>
filename TYPE=DIR<CR><LF>
...
<FF>
```

If the *pathname* is invalid:

```
@PJL FSDIRLIST NAME = "pathname"[<CR>]<LF>
FILEERROR=number<CR><LF>
<FF>
```

Parameters:

Parameter	Functional Range	Default
NAME="*pathname*"	Roman-8 characters 01 thru 255	N/A
ENTRY=*integer*	1 to $2^{31} - 1$	N/A
COUNT=*integer*	1 to $2^{31} - 1$	N/A

- **NAME = "*pathname*"** — for the FSDIRLIST command, *pathname* must be a directory (not a file). For a complete description of the NAME parameter, see the *NAME = "pathname"* description on pages 9-2 and 9-3.
- **ENTRY = *integer*** — Every file or subdirectory that has been created on the file system is considered an entry. The entry variable is the number of the starting entry to be displayed. For

example, to display the directory listing beginning with line 5, you would use ENTRY=5. The entry value must be greater than 0. Also, if the entry value is larger than the actual number of entries, the response will not include any entries.

- **COUNT = *integer*** — The count variable specifies the number of entries to be returned. If the specified count is greater than the actual number of entries in the specified range, the actual number of entries will be displayed.

Printer Responses

The printer response indicates the number of bytes in the listed files (SIZE=*number of bytes*). If the pathname is invalid, a FILEERROR number is returned. This error number is equivalent to the PJL File System error numbers (32xxx) listed in Appendix D, minus the 32 and the leading zeros. For example, if the printer returns FILEERROR=17, the error is equivalent to status code 32017 (Invalid parameter), meaning the FSDIRLIST command contained an invalid parameter. See *PJL File System Errors (32xxx)* in Appendix D for a complete list of error codes.

Example: Using the FSDIRLIST Command

This example demonstrates using the FSDIRLIST command to return a directory list from the printer's file system.

```
@PJL FSDIRLIST NAME = "0:\pcl\macros" ENTRY=1
↵COUNT=25 <CR><LF>
```

A sample response would appear similar to this:

```
@PJL FSDIRLIST NAME = "0:\pcl\macros"
↵ENTRY=1<CR><LF>
. TYPE=DIR<CR><LF>
.. TYPE=DIR<CR><LF>
invoice.prn.rl  TYPE=FILE SIZE=1619<CR><LF>
page1.prn.tf    TYPE=FILE SIZE=2260<CR><LF>
gen_cond.prn.mt TYPE=FILE SIZE=900<CR><LF>
pclResourceFile TYPE=FILE SIZE=420<CR><LF>
```

Related Commands:

FSAPPEND, FSDELETE, FSDOWNLOAD, FSINIT, FSMKDIR, FSQUERY, FSUPLOAD, INFO FILESYS

FSDELETE Command

The FSDELETE command is used to delete files or empty directories from the printer's file system.

Syntax:

```
@PJL FSDELETE NAME = "pathname" [<CR>]<LF>
```

Parameters:

Parameter	Functional Range	Default
NAME = "*pathname*"	Roman-8 characters 01 thru 255	N/A

- **NAME = "*pathname*"** — For a complete description of the NAME parameter, see the *NAME = "pathname"* description on pages 9-2 and 9-3.

Example: Using the FSDELETE Command

This example demonstrates using the FSDELETE command to delete a file from the printer's file system.

```
@PJL FSDELETE NAME = "0:\pcl\macros\Name: HP
⤷Logo; Application; ABC; Manufacturer: XYZ;
⤷Version: 7.9; Date: 8/17/94" <CR><LF>
```

Related Commands:

FSAPPEND, FSDIRLIST, FSDOWNLOAD, FSINIT, FSMKDIR, FSQUERY, FSUPLOAD, INFO FILESYS

FSDOWNLOAD Command

The FSDOWNLOAD command downloads a file to the printer file system. If a file with the same name exists, the downloaded file overwrites it.

Syntax:

```
@PJL FSDOWNLOAD FORMAT:BINARY SIZE=int
↩NAME = "pathname" [<CR>]<LF>
<binary data><ESC>%-12345X
```

Parameters:

Parameter	Functional Range	Default
SIZE=*integer*	0 to $2^{31} - 1$	N/A
NAME = "*pathname*"	Roman-8 characters 01 thru 255	N/A

- **SIZE = *integer*** — The size variable indicates the number of bytes in the file to be downloaded. The size indicates the number of bytes immediately following the <LF> to the next UEL command.
- **NAME = "*pathname*"** — For the FSDOWNLOAD command, "*pathname*" must be a file (not a directory). For a complete description of the NAME parameter, see the *NAME = "pathname"* description on pages 9-2 – 9-3.
- ***<binary data>*** — This is the binary file data to be downloaded, such as font files and macro data.

Example: Using the FSDOWNLOAD Command

This example demonstrates using the FSDOWNLOAD command to download a file to the printer file system.

```
@PJL FSDOWNLOAD FORMAT:BINARY
↩NAME = "0:\pcl\macros\Name: HP Logo;
↩Application; ABC; Manufacturer: XYZ;
↩Version: 7.9; Date:8/7/94" SIZE = 22<CR><LF>
22 bytes of macro data<ESC>%-12345X
```

Related Commands:

FSAPPEND, FSDELETE, FSDIRLIST, FSINIT, FSMKDIR, FSQUERY, FSUPLOAD, INFO FILESYS

FSINIT Command

The FSINIT command is used to initialize the printer's mass storage file system. This FSINIT command must be part of a secure job.

Syntax:

```
@PJL FSINIT VOLUME = "pathname" [<CR>]<LF>
```

Parameters:

Parameter	Functional Range	Default
VOLUME = "*pathname*"	0:, 1:*, 2:*	N/A

* Volumes 1: and 2: are only supported on the HP LaserJet 4000 and newer printers.

- **VOLUME** = "***pathname*"** — The variable *pathname* must be a volume.

Example: Using the FSINIT Command

This example demonstrates using the FSINIT command to initialize volume 0 of the printer file system.

```
@PJL FSINIT VOLUME = "0:" [<CR>]<LF>
```

Related Commands:

FSAPPEND, FSDELETE, FSDIRLIST, FSDOWNLOAD, FSMKDIR, FSQUERY, FSUPLOAD, INFO FILESYS

FSMKDIR Command

The FSMKDIR command creates the specified directory on the printer file system.

Syntax:

```
@PJL FSMKDIR NAME = "pathname" [<CR>]<LF>
```

Parameters:

Parameter	Functional Range	Default
NAME = "*pathname*"	Roman-8 characters 01 thru 255	N/A

- **NAME = "*pathname*"** — For the FSMKDIR command, "*pathname*" must be a file (not a directory). For a complete description of the NAME parameter, see the *NAME = "pathname"* description on pages 9-2 and 9-3.

Example: Using the FSMKDIR Command

The following two command lines demonstrate using the FSMKDIR command to create directories on the printer file system.

```
@PJL FSMKDIR NAME = "0:\pcl" [<CR>]<LF>
@PJL FSMKDIR NAME = "0:\pcl\macros" [<CR>]<LF>
```

Related Commands:

FSAPPEND, FSDELETE, FSDIRLIST, FSDOWNLOAD, FSINIT, FSQUERY, FSUPLOAD, INFO FILESYS

FSQUERY Command

The FSQUERY command is used to determine if a given entry exists within the file system, the type of entry (file or directory), and if it is a file, the file size in bytes.

Syntax:

```
@PJL FSQUERY NAME = "pathname" [<CR>]<LF>
```

Response Syntax:

If *pathname* is a file:

```
@PJL FSQUERY NAME="pathname" TYPE=FILE
↪SIZE=integer<CR><LF>
<FF>
```

If *pathname* is a directory:

```
@PJL FSQUERY NAME="pathname" TYPE=DIR<CR><LF>
<FF>
```

If the *pathname* is invalid:

```
@PJL FSQUERY NAME="pathname"<CR><LF>
↪FILEERROR=number<CR><LF>
<FF>
```

Parameters:

Parameter	Functional Range	Default
NAME="*pathname*"	Roman-8 characters 01 thru 255	N/A

- **NAME = "*pathname*"** — For a complete description of the NAME parameter, see the *NAME = "pathname"* description on pages 9-2 and 9-3.

Printer Responses

The printer response indicates the number of bytes in the queried files. If the pathname is invalid, a FILEERROR number is returned. The returned number is equivalent to the PJL File System errors (32xxx) listed in Appendix D, only without the 32 and the leading zeros. For example, if the printer returns FILEERROR=7, the error is equivalent to status code 32007 (Illegal name), meaning the FSQUERY command contained an illegal NAME variable. See *PJL File System Errors (32xxx)* in Appendix D for a complete list of error codes.

Example: Using the FSQUERY Command

The following two command lines demonstrate using the FSQUERY command to check for the existence of a file and a directory on the printer's file system.

```
@PJL FSQUERY NAME = "0:\pcl\file1" <CR><LF>
@PJL FSQUERY NAME = "0:\pcl\macro\" <CR><LF>
```

Related Commands:

FSAPPEND, FSDELETE, FSDIRLIST, FSDOWNLOAD, FSINIT, FSMKDIR, FSUPLOAD, INFO FILESYS

FSUPLOAD Command

The FSUPLOAD command uploads a file, or a part of a file, from the printer file system to the host.

Syntax:

```
@PJL FSUPLOAD NAME = "pathname"
↵OFFSET=<number> SIZE=<number>[<CR>]<LF>
```

Response Syntax:

If the *pathname* is valid:

```
@PJL FSUPLOAD FORMAT:BINARY
↵NAME = "pathname" OFFSET=<number>
↵SIZE=<number><CR><LF>
<SIZE bytes of file data>
<FF>
```

If the *pathname* is invalid:

```
@PJL FSUPLOAD NAME = "pathname"<CR><LF>
FILEERROR=<number><CR><LF>
<FF>
```

Parameters:

Parameter	Functional Range	Default
NAME="*pathname*"	Roman-8 characters 01 thru 255	N/A
OFFSET=*integer*	0 to $2^{31} – 1$	N/A
SIZE=*integer*	0 to $2^{31} – 1$	N/A

- **NAME = "*pathname*"** — For the FSUPLOAD command, the variable *pathname* must be a file name (not a directory). For a complete description of the NAME parameter, see *NAME = "pathname"* on pages 9-2 to 9-3.
- **OFFSET = *integer*** — The offset variable specifies the offset, from the beginning of the file, indicating the point to begin uploading.

- **SIZE = *integer*** — The size variable indicates the number of bytes to be uploaded. If the amount of data in the file after OFFSET is less than the specified size value, the remainder of the file is returned and the SIZE value in the response indicates the actual amount of uploaded data.

Printer Responses

If the pathname is invalid the printer response includes an error number. The returned number is equivalent to the PJL File System errors (32xxx) listed in Appendix D, only without the 32 and the leading zeros. For example, if the printer returns FILEERROR=7, the error is equivalent to status code 32007 (Illegal name), meaning the FSUPLOAD command contained an illegal NAME variable. See *PJL File System Errors (32xxx)* in Appendix D for a complete list of error codes.

Example: Using the FSUPLOAD Command

This example demonstrates using the FSUPLOAD command to upload 512 bytes from a printer file, beginning with byte 25.

```
@PJL FSUPLOAD NAME = "0:\pcl\filenumber5"
↵OFFSET=25 SIZE = 512<CR><LF>
```

Related Commands:

FSAPPEND, FSDELETE, FSDIRLIST, FSDOWNLOAD, FSINIT, FSMKDIR, FSQUERY, INFO FILESYS

File System Example

The following is a sequence of commands that can be sent to any printer with flash memory or a hard disk. The example downloads and calls a macro from the flash memory or hard disk. See the sections following this example for a description of each command.

```
<ESC>%-12345X
⤶@PJL FSMKDIR NAME ="0:\pcl" <CR><LF>
@PJL FSMKDIR NAME ="0:\pcl\macros" <CR><LF>
@PJL FSDOWNLOAD FORMAT:BINARY
⤶NAME ="0:\pcl\macros\a_macro" SIZE=29<CR><LF>
<ESC>*p900x1500YThis is the macro
⤶<ESC>%-12345X
⤶<ESC>%-12345X@PJL ENTER LANGUAGE=PCL <CR><LF>
<ESC>&f1Y
<ESC>&n8W♣a_macro
<ESC>&f4X
<ESC>E
<ESC>%-12345X
⤶@PJL DEFAULT DISKLOCK = ON <CR><LF>
```

Note

The ⤶ symbol indicates that this text string is part of the preceding line. That is, there should be no carriage return or line feed control codes at the end of the preceding line.

First Command

```
<ESC>%-12345X
```

This PJL command causes the printer to exit the active printer language and give control to PJL.

Second Command

```
⤶@PJL FSMKDIR NAME ="0:\pcl" <CR><LF>
```

This PJL command creates the *pcl* directory on volume 0: of the printer's file system.

Third Command

```
@PJL FSMKDIR NAME ="0:\pcl\macros" <CR><LF>
```

This PJL command creates the *macros* sub-directory under the *pcl* directory.

Fourth Command

```
@PJL FSDOWNLOAD FORMAT:BINARY
⤺NAME ="0:\pcl\macros\a_macro" SIZE=29<CR><LF>
<ESC>*p900x1500YThis is the macro
⤺<ESC>%-12345X
```

This PJL command does several things. First, it specifies the download format to be binary (`FORMAT:BINARY`). Second, it specifies the macro's pathname on the file system (`NAME = “0:\pcl\macros\a_macro”`). Third, it specifies the number of bytes to be downloaded for this macro file (`SIZE=29`). Fourth, it contains the binary data to be downloaded (`<ESC>*p900x1500YThis is the macro`).

Fifth Command

```
⤺<ESC>%-12345X@PJL ENTER LANGUAGE=PCL <CR><LF>
```

This command explicitly enters the PCL language.

Sixth Command

```
<ESC>&f1Y
```

The Macro ID command sets the current macro ID to 1.

Seventh Command

```
<ESC>&n8W♣a_macro
```

The Alphanumeric ID command associates the current macro ID to the string ID which is *a_macro.* In this example, the string name must be the same filename used with the FSDOWNLOAD command in the fourth command sequence.

The Alphanumeric ID command needs to know the number of bytes being sent after the terminating W. In this example, we are sending 8 bytes. The first byte, which is the ♣ symbol, is the control-byte (The ♣ symbol is the character with a decimal value of 005). This control byte indicates that the Alphanumeric ID command will be used to associate the current macro ID to the string ID. The other 7 bytes are the characters that make up the string ID (a_macro).

Eighth Command

<ESC>&f4X

The Macro Control command with a value of 4 enables automatic overlay for the macro with the last specified ID. That is, this command prints the macro.

Note that <ESC>&f2X and <ESC>&f3X will also work here.

Ninth Command

<ESC>E

The Printer Reset command causes the printer to print and eject the page. It also restores the User Default Environment and deletes temporary fonts and macros.

Tenth Command

<ESC>%-12345X

This PJL command causes the printer to exit the active printer language and return control to PJL.

Eleventh Command

←@PJL DEFAULT DISKLOCK = ON <CR><LF>

This command sets the disk or flash memory to read-only. In this state, it is not possible to format the disk, download fonts or macros, or delete fonts or macros.

Example Summary

The FSDOWNLOAD command downloads data to printers which support this command. This command allows data to be downloaded to either the printers internal disk (such as available in HP LaserJet 4000 series, 5Si, 5SiMx, and 5Si Mopier printers) or flash memory (such as available in HP LaserJet 5, 5M, and 4000 series printers).

To identify what is stored on the disk or in flash memory, you can print a directory listing for that memory device. This directory listing identifies all directories, file names, and file sizes. A directory listing can be printed from the printer's control panel by selecting either the Disk Directory page or the Flash Directory page in the Test menu.

Note

A file system command sequence can be typed in a text editor and copied to the printer, but there are some places where binary data needs to be sent. This is not a problem as long as there is an ASCII character equivalent to the necessary decimal value. For example, the decimal value for Escape is 027. There is an ASCII character (←) for this decimal value, thus it can be typed in a text editor.

There might be times when a text editor will not allow you to type a character with a certain decimal value. For example, you might need to send the character whose decimal value is 000. There is no ASCII character for that value, thus a text editor will not allow you to send this byte to the printer.

10 Job Management

Introduction

Some printers, such as the HP LaserJet 8100 and 8500 series, provide the capability for storing print jobs on the printer's hard disk. These jobs can be accessed and printed using PJL commands as described in this chapter.

Note For information about products newer than those included in this book, see the *Printer Job Language Technical Reference Addendum*, which includes product-specific information about newer products, as well as commands and variables added to PJL to support these newer products.

The HP LaserJet 8100 and 8500 series printers differ in the way they support job management. Separate descriptions and examples are given for each printer.

Note Job retention features are not available in printers that do not have a hard disk. Software should query the printer to determine if these features are available and only send the PJL commands to utilize them if they are available.

HP LaserJet 8100 Printer

Using the SET command and the PJL variables described in this chapter, the application can assign the job a job name and a user name, store specific jobs for later printing, print one proof copy and hold the job until the job is proofed, and add password (HOLDKEY) protection to a held job.

The following variables are used for job management:

- HOLD
- JOBNAME

- HOLDKEY
- HOLDTYPE
- USERNAME

Each variable is described in the following paragraphs. The variable descriptions are followed by a job management example.

HOLD Variable

Specifies the retention classification of the job, indicating whether the job is printed immediately or stored.

Values	Value Description
(OFF)	The job is printed but not retained on the disk after printing. This is the default.
ON	The requested number of copies are printed and the job is temporarily stored on disk. The job is then available for printing additional copies through the control panel and through JetAdmin. The number of jobs that can be stored is limited by disk space. When the limit is exceeded, the oldest job is removed from the disk.
PROOF	One copy of the job is printed and remaining copies are stored on disk. The job is then available to select for printing via the control panel menus or through JetAdmin. The job will be deleted from the disk when the disk space is needed for another Proof and Hold job but only after the additional copies have been printed. It will also be deleted when the user sends down another Proof and Hold job with the same job name, or if the user explicitly deletes the job.
STORE	The job is not printed immediately but is retained on disk. The job is available to select for printing via the control panel (PRIVATE/ STORED JOBS menu) or through JetAdmin. The job will not be deleted from the disk after printing.

HOLDKEY Variable

The HOLDKEY variable acts as a password to protect a held job. It is a four-digit string that is specified in the job stream. A HOLDKEY value must be specified if HOLDTYPE is PRIVATE (otherwise, the job will be considered PUBLIC). The variable value can be any four-digit value from 0000 to 9999. The default value is “”.

HOLDTYPE Variable

The HOLDTYPE variable specifies the privacy level of the job. Valid values are PUBLIC and PRIVATE.

Value	Value Description
PUBLIC	The job does not require a HOLDKEY value in order to be released for printing. This is the default value.
PRIVATE	The job requires a HOLDKEY value in order to be released for printing. If the HOLD-TYPE is set to PRIVATE, a HOLDKEY value must be specified. If no HOLDKEY is specified, the job will be considered PUBLIC.

JOBNAME Variable

This variable is the job name that may be generated by the driver or obtained from user input. This value may be used in conjunction with the USERNAME to select a job from the control panel. If the job stream does not contain a JOBNAME, the printer will assume no job name. Each subsequent job that is sent down by the same user will replace the user's last job on disk. The driver is responsible for determining the size of the printer's control panel and sending a string of appropriate length.

Note To determine the size of the printer's control panel, use the INFO CONFIG command, which is explained in Chapter 7. The returned DISPLAY LINES value indicates the number of lines on the display, and the DISPLAY CHARACTER SIZE value indicates the number of characters that can be displayed.

Value	Value Description
"*jobname string*"	This string is limited by the size of the printer's control panel display (up to 80 characters).

USERNAME Variable

This variable is the user name that is obtained from user input or by the driver through some internal method. If the job stream does not contain a USERNAME the default value will be "NO USER NAME". The driver is responsible for determining the size of the printer's control panel and sending a string of appropriate length.

Value	Value Description
"*username string*"	This string is limited by the size of the printer's control panel display. The default value is "NO USER NAME".

Example: Job Management HP LaserJet 8100

The following PJL example demonstrates job management. It creates a secure Proof and Hold job that will print one copy and then be held until the user selects it for printing via the control panel or JetAdmin.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT **Give job a name** <CR><LF>
@PJL SET JOBNAME = "Job_12345" <CR><LF>
@PJL COMMENT **Specify a user name**<CR><LF>
@PJL SET USERNAME = "Slim_Jim" <CR><LF>
@PJL COMMENT **Set Quantity to Print**<CR><LF>
@PJL SET QTY = 4 <CR><LF>
@PJL COMMENT **Specify Proof & Hold**<CR><LF>
@PJL SET HOLD = PROOF<CR><LF>
@PJL COMMENT **Specify private job**<CR><LF>
@PJL SET HOLDTYPE = PRIVATE<CR><LF>
@PJL SET HOLDKEY = "0246"<CR><LF>
@PJL ENTER LANGUAGE = POSTSCRIPT <CR><LF>
%!PS-ADOBE . . . PostScript print job . . . ^D
⤾<ESC>%-12345X
```

HP LaserJet 8500 Printer

The HP LaserJet 8500 printer implements job management in a different way than the HP LaserJet 8100 printer. For this printer, only the HOLD = JOB option is supported for the HOLD command. The HOLDTYPE and HOLDKEY variables are not supported. (See the descriptions of the HOLD, JOBNAME and USERNAME variables for more information about their limitations.)

The printer's Proof and Print feature allows the user a fast and easy way to proof one copy of the job, then quickly print any remaining copies without waiting for data transmission or processing time for the subsequent copies. Using the printer's control panel buttons, selecting the PROOF AND PRINT menu item displays the JOB NAME and USER NAME on the control panel display. The ITEM keys can then be used to scroll through the list of printable jobs currently on the disk. The VALUE keys can be used to change the number of copies selected. Choosing SELECT launches the job. Once the job is launched, the number of copies cannot be changed.

When all copies of the job have been completely printed, the file is removed from the disk. Pressing CANCEL JOB while the job is printing or when the JOBNAME is displayed on the control panel cancels printing and deletes the file from the disk.

Turning the printer power off or the occurrence of non-correctable errors causes the printer to save the file on the printer's disk. The number of copies completed will not be updated from the original number if the job does not complete without error. If all copies of the Proof and Print files have not been printed, the job will remain on the disk indefinitely until the user specifically deletes the job. The user can delete the job using the control panel by selecting the job and setting the number of copies to zero. Alternatively they can select the job and press the Job Cancel key.

HOLD Variable

Specifies the retention classification of the job, indicating whether the job is printed immediately or stored.

Values	Value Description
JOB	Notifies printer to hold the job until all copies have been printed.

JOBNAME Variable

This variable is the job name that may be generated by the driver or obtained from user input. This value may be used in conjunction with the USERNAME to select a job from the control panel. If the job stream does not contain a JOBNAME, the printer will assume no job name. Each subsequent job that is sent down by the same user will replace the user's last job on disk. The driver is responsible for determining the size of the printer's control panel and sending a string of appropriate length.

Value	Value Description
"*jobname string*"	For the HP LaserJet 8500, the string is limited to 16 characters of 7-bit ASCII text [uppercase A – Z, plus the period (.), underscore (_), hyphen (–), and asterisk (*)]. The default value is “”.

USERNAME Variable

This variable is the user name that is obtained from user input or by the driver through some internal method. If the job stream does not contain a USERNAME the default value will be "NO USER NAME". The driver is responsible for determining the size of the printer's control panel and sending a string of appropriate length.

Value	Value Description
"*username string*"	For the HP LaserJet 8500, the string is limited to 16 characters of 7-bit ASCII text [uppercase A – Z, plus the period (.), underscore (_), hyphen (–), and asterisk (*)]. The default value is "NO USER NAME".

Example: Job Management HP LaserJet 8500

The following PJL example demonstrates job management for the HP LaserJet 8500 printer. It creates a secure Proof and Print job that prints one copy and then is held until the user selects it for printing via the control panel.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT **Give job a name** <CR><LF>
@PJL SET JOBNAME = "Job_876543" <CR><LF>
@PJL COMMENT **Specify a user name**<CR><LF>
@PJL SET USERNAME = "Mary_Smith" <CR><LF>
@PJL COMMENT **Set Quantity to Print**<CR><LF>
@PJL SET QTY = 15 <CR><LF>
@PJL COMMENT Specify Proof & Print Job<CR><LF>
@PJL SET HOLD = JOB<CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC E> . . . PCL print job . . . <ESC E>
⮐<ESC>%-12345X
```

11 Programming Tips for Using PJL

Introduction

When using most printer languages, there is usually more than one way to perform a certain printing function. PJL is no exception. Properly formed PJL jobs provide the developer with the desired features while eliminating glitches. This chapter provides tips for creating efficient PJL jobs that eliminate potential problems.

Note Improperly coded print jobs may work fine in a single-computer/ single-printer environment running only one application, but cause problems in a multi-application or shared network environment.

The first part of this chapter categorizes PJL applications into three general types, and provides guidance and examples for each type. The remainder of the chapter provides hints for handling specific situations, including using status readback in a multi-user system.

Note For information about products newer than those included in this book, see the *Printer Job Language Technical Reference Addendum*, which includes product-specific information about newer products, as well as commands and variables added to PJL to support these newer products.

PJL Services

This section segments applications into three types based on the services provided. Applications using PJL can be categorized as one of the following:

- **Print Data Generators**—Applications that generate print jobs, such as Lotus 1-2-3, Microsoft Word, and WordPerfect.
- **Printer Utilities**—Applications that control printer features, or request and provide printer status. These applications also can monitor the current state of the printer.
- **Spoolers**—Applications that control print jobs generated by other applications.

Many applications provide more than one of the services listed above. For example, a Spooler can be used to monitor the printer and provide control over printer features, and print jobs. If an application does provide more than one service, only use those PJL commands appropriate for the provided services.

If applications providing different printer services follow the guidelines described in this section, they can work together properly. This chapter lists the commands used by each application type, explains the functions of each command, and offers several examples illustrating different PJL functions.

Print Data Generators

Print Data Generators are applications used to create and print information. Examples include WordPerfect, Harvard Graphics, and Lotus 1-2-3.

Software applications of this type should work properly when the printer is under the direct control of the application, and also when there is a spooler between the application and the printer. This is accomplished by using the ENTER command to select the proper printer language before sending print data to the spooler or printer. The UEL command should precede and follow the print job.

Print Data Generators should only use PJL commands when a corresponding command does not exist in the printer language. This is recommended so that the application does not override feature settings and adversely affect future jobs. To change feature settings for the duration of the job, or until the next PJL reset condition, use the SET command. Do not use the PJL INITIALIZE command for Print Data Generators.

Commands Used by Print Data Generators

UEL	Use before and after every PJL job.
COMMENT	Use to add explanations within PJL code.
ENTER	To select the correct printer language for the print job.
SET	To select a desired feature when it is not possible using the desired printer language (such as PCL or PostScript).
RESET	Use at the end of the job if the SET command is used in the job.

Print Data Generator Examples

The following two examples demonstrate how applications categorized as “Print Data Generators” should use PJL. Both examples work well if sent directly to the printer or through a spooler.

Jobs That Select a Printer Language

This example selects a printer language using the ENTER command. It is the most common job format for Print Data Generators.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL ENTER LANGUAGE = POSTSCRIPT <CR><LF>
%!PS-ADOBE ... PostScript code ... ^D
↩<ESC>%-12345X
```

Jobs That Set Printer Features

This example specifies two feature settings that cannot be selected using the specified printer language:

```
<ESC>%-12345X@PJL <CR><LF>
@PJL SET RET = LIGHT <CR><LF>
@PJL SET RESOLUTION = 600 <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E ... PCL print data ... <ESC>E
↩<ESC>%-12345X@PJL <CR><LF>
@PJL RESET <CR><LF>
<ESC>%-12345X
```

Printer Utilities

Printer utilities are those applications that perform one or more of the following functions:

- **Control printer resources**—These programs set printer features such as the print resolution and number of copies using the SET, RESET, DEFAULT, and INITIALIZE commands.
- **Request information from the printer**—Printer status and feature settings can be requested from the printer using the ECHO, INFO, INQUIRE, and DINQUIRE commands. Applications should only use PJL commands that request status if the application is in direct control of the printer and there is a bi-directional communication channel between the printer and the application.
- **Monitor the printer status**—Device status and timed status can inform the application of printer events such as printer open, paper out, or low toner. The USTATUS DEVICE and USTATUS TIMED commands are used to monitor printer status. Applications can continuously monitor the printer for changes in printer state. When the printer changes state, the application takes appropriate action, such as informing the user.

In general, the Printer Utilities described here are not used to print information, but enable the user to request the current printer feature settings and modify features as desired.

Commands Used by Printer Utilities

UEL	Use before and after every PJL job.
COMMENT	Use to add explanations within PJL code.
SET	To modify a printer feature until the next PJL reset condition.
RESET	To set the printer to its user default feature settings.
DEFAULT	To modify the user default value of a printer feature. (NOTE: In shared environments, this feature should be used by system administrators only.)
INITIALIZE	To set the printer to its factory default settings. (NOTE: In shared environments, this feature should be used by system administrators only.)

Printer utilities that are equipped for bi-directional communications can request printer status using the following commands:

INQUIRE	To request the current setting for a particular feature.
DINQUIRE	To request the default setting for a particular feature.
INFO	To find the printer model, printer configuration, memory available, status information, page count, or printer variables.
ECHO	To synchronize requested status information.
USTATUS DEVICE	To be informed when the printer status changes.
USTATUS TIMED	To receive unsolicited printer status at periodic intervals.

Printer Utility Examples

The following three examples demonstrate the kind of PJL jobs used by Printer Utilities:

- Jobs that request information and perform printer setup
- Jobs that request information, set features, and print existing files
- Jobs that monitor printing status

Jobs that Request Information and Perform Print Setup

The following example demonstrates a job setup utility that first asks for printer information, then sets default features to a desired state. This application functions like a remote control panel. This type of utility enables users to select PJL features before printing from another application that cannot select PJL features. In this example, the DEFAULT command is used instead of the SET command, so that changes apply to all future print jobs.

Note Since this application uses the DEFAULT command, it changes the User Default Environment and control panel settings. In multi-user situations, it should be used only by printer administrators to avoid unexpected results by other users.

```
(Reading Status Information)
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Requesting features <CR><LF>
@PJL ECHO 15:18:25.3 07-25-92 <CR><LF>
[. . application discards any printer status readback
information received before the ECHO response . .]
@PJL DINQUIRE RET <CR><LF>
@PJL DINQUIRE RESOLUTION <CR><LF>
[. . application receives status readback from the
DINQUIRE commands showing that RET = OFF and
RESOLUTION = 300.  . . .]
<ESC>%-12345X
```

```
(Changing the Default Values)
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Set desired values <CR><LF>
@PJL DEFAULT RET = DARK <CR><LF>
@PJL DEFAULT RESOLUTION = 600 <CR><LF>
@PJL COMMENT Reset PJL to ensure default
↵values take effect <CR><LF>
@PJL RESET <CR><LF>
<ESC>%-12345X
```

Jobs That Request Information, Set Features and Print Existing Files

The following example requests information using the INQUIRE command, sets printer features using the SET command, and then sends an existing application print file to the printer. To restore the default values, the RESET command is issued before the job closes.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Requesting features <CR><LF>
@PJL ECHO Job #53 11-17-92 08:52:03.7 <CR><LF>
[. . application discards any printer status readback
information received before the ECHO response . .]
@PJL INQUIRE RET <CR><LF>
@PJL INQUIRE PAGEPROTECT <CR><LF>
@PJL INQUIRE RESOLUTION <CR><LF>
<ESC>%-12345X
```

[. . application receives status readback from the INQUIRE commands showing that RET = OFF, PAGEPROTECT = LETTER, and RESOLUTION = 300, which are not the desired settings. The application then sends SET commands to modify the settings to the desired value . .]

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Set desired values <CR><LF>
@PJL SET RET = MEDIUM <CR><LF>
@PJL SET PAGEPROTECT = OFF <CR><LF>
@PJL SET RESOLUTION = 600 <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E . . . PCL file . . .<ESC>E
↵<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Reset PJL to restore <CR><LF>
@PJL COMMENT control panel defaults <CR><LF>
@PJL RESET <CR><LF>
<ESC>%-12345X
```

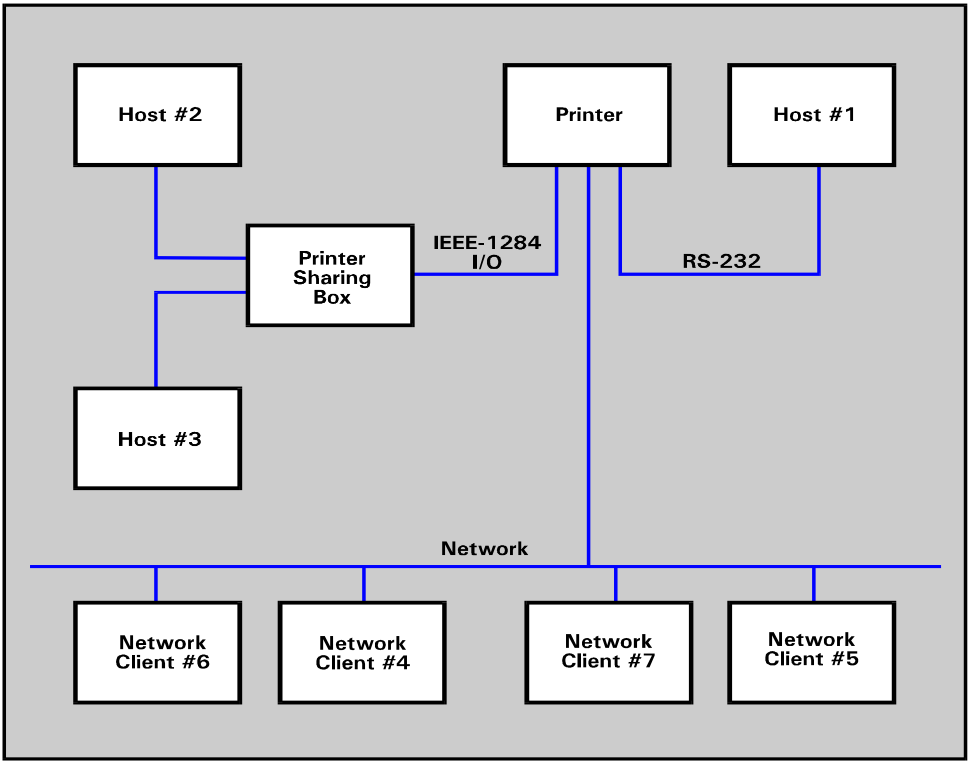


Figure 11-1 Sample Printing System Components

Jobs That Monitor Printing Status

The following example enables unsolicited printer status using the USTATUS DEVICE command. After unsolicited device status is enabled, the printer automatically sends a status response whenever the printer's status changes.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL ECHO Acme #17 8-28-92 5:39:02.9 <CR><LF>
@PJL COMMENT Turn on unsolicited device
↩status <CR><LF>
@PJL USTATUS DEVICE = ON <CR><LF>
<ESC>%-12345X
```

Spoolers

Spoolers are applications that control and/or monitor print jobs generated by other applications.

Spooling applications should use only PJL job-related commands when controlling the flow of print jobs to the printer. Encapsulate each print job with the JOB command at the beginning and the EOJ command at the end (the UEL command is always the first and last command in all PJL jobs).

Spoolers perform one or more of the following operations:

- **Confirm job completion**—To notify the spooler when the job is completely processed, use the USTATUS JOB = ON command. When this command is used, the EOJ command at the end of the job triggers the printer to send unsolicited job status information when the last page of the job is printed and in the output tray.
- **Cancel jobs** (only HP LaserJet 5/5M, 5Si/5SiMx/5Si Mopier, and other printers that support job cancel)—The spooler can cancel the print job using the PML printer language or a user can cancel the job using the control panel. If unsolicited job status is enabled, the printer notifies the application that the job has indeed been canceled.
- **Monitor job progress**—If you want the spooler to monitor the page-by-page progress of a job, enable the page status with the USTATUS PAGE=ON command. As each page lands in the output tray, the printer sends an unsolicited page status message to the spooler.
- **Interact with the user**—To flash a message on the printer's display and take the printer off-line, use the OPMSG or STMSG commands. These commands are used to notify the user of a required action before printing can continue. For example, you can display “LOAD BLUE PAPER” and then wait until the user presses the Continue or On Line key. To display a message without taking the printer off-line, use the RDYMSG command.
- **Select a Printer Language or Print a Banner Page**— If the spooler is responsible for printer language selection or printing banner pages, use the ENTER LANGUAGE command. (Performance is not adversely affected if both the application file and the spooler send the ENTER LANGUAGE command.)

- **Print selected pages of jobs**—Use the JOB command with the START and END options to specify which pages you want to print.

Commands Used by Spoolers

UEL	Use before and after every PJL job.
COMMENT	Use to add explanations within PJL code.
DEFAULT	To modify the default value of a printer feature. (NOTE: In shared environments, this feature should be used by system administrators only.)
ENTER	Use if responsible for printer language selection or banner printing.
JOB/EOJ	Use to monitor printing status, name jobs, print portions of a job, mark job boundaries.
OPMSG	To display a customized message and take the printer off-line until the operator presses the On Line, Continue, or Reset key.
RDYMSG[1]	To replace the control panel “00 READY” message with a customized message.

[1] For the LaserJet 4000 and newer printers, use the JOB DISPLAY = “display text” method instead of (or as well as) RDMSG. Refer to the note on page 8-2.

Spoolers equipped for bi-directional communications can monitor printer status using the following commands:

ECHO	To synchronize status readback information. The application should send an ECHO command before any other status readback commands; all status responses before the returned ECHO response should be discarded to ensure proper synchronization.
STMSG	To display a customized message and take the printer off-line until the operator presses the On Line, Continue, Job Cancel, or Reset key. Returns the name of the key that the operator pressed.
USTATUSOFF	To turn off all unsolicited status before specifying the desired USTATUS.
USTATUS PAGE	To receive notification as each page lands in the output tray.
USTATUS JOB	To monitor job progress. Sends status message when job has completed.

Spooler Examples

The following examples show jobs used by spooling applications:

- Jobs that monitor job progress and confirm job completion
- Jobs that notify the user to load specific forms or paper
- Jobs that control printer resources and print selected pages
- Jobs that print a banner page followed by an application-generated job (application specifies printer language)
- Jobs that print a banner page followed by an application-generated job (application does not specify printer language)

In each example, the indented lines indicate commands belonging to a print file created by another application.

Jobs That Monitor Job Progress and Confirm Job Completion

This example enables the spooler to receive notification as each page is finished printing, and when the entire job has finished. The USTATUS JOB = ON command enables unsolicited job status and the USTATUS PAGE = ON command enables page status.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Monitoring Job Progress <CR><LF>
@PJL COMMENT and Completion <CR><LF>
@PJL ECHO 12:07:54.5 07-26-92 <CR><LF>
[. application discards printer status readback data
received before ECHO response .]
@PJL USTATUS JOB = ON <CR><LF>
@PJL USTATUS PAGE = ON <CR><LF>
@PJL JOB NAME = "Monitoring Job" <CR><LF>
  <ESC>%-12345X@PJL <CR><LF>
  @PJL ENTER LANGUAGE = PCL <CR><LF>
  <ESC>E... PCL print data ...<ESC>E
  ↵<ESC>%-12345X
↵<ESC>%-12345X@PJL <CR><LF>
@PJL EOJ NAME = "End of Monitor Job" <CR><LF>
@PJL USTATUS JOB = OFF <CR><LF>
@PJL USTATUS PAGE = OFF <CR><LF>
<ESC>%-12345X
```

When the printer processes the JOB command, the following unsolicited job status message is sent:

```
@PJL USTATUS JOB
START
NAME="Monitoring Job"
<FF>
```

When USTATUS PAGE = ON, the first unsolicited page status message is sent after page 1 lands in the output tray:

```
@PJL USTATUS PAGE
1
<FF>
```

Additional page status messages are sent after each succeeding page lands in the output tray. After the job is completely printed, the host receives unsolicited page and job status as follows (assuming a 38-page job):

```
@PJL USTATUS PAGE
38
<FF>

@PJL USTATUS JOB
END
NAME="End of Monitor Job"
PAGES=38
<FF>
```

The unsolicited *page* status indicates that the 38th page printed. The *job* status indicates that the EOJ command was received, and that 38 pages were printed. (The page count is incremented by one for each simplex page formatted, and by two for each duplex page formatted.)

Jobs That Notify the User to Load Specific Forms or Paper

This example displays a message to “LOAD FORM 1040” and takes the printer off-line. When the form is loaded and the On Line or Continue key is pressed, the form is printed.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL JOB NAME = "Job #65432" <CR><LF>
@PJL OPMSG DISPLAY = "LOAD FORM 1040" <CR><LF>
  <ESC>%-12345X@PJL <CR><LF>
  @PJL ENTER LANGUAGE = PCL <CR><LF>
  <ESC>E ... PCL print data ... <ESC>E
  ⮐<ESC>%-12345X
⮐<ESC>%-12345X@PJL <CR><LF>
@PJL EOJ NAME = "Job #65432" <CR><LF>
<ESC>%-12345X
```

Jobs That Control Printer Resources and Print Selected Pages

The following job prints 1 copy of pages 5 through 8 of the print job. The START command tells the printer to process pages in non-printing mode until the specified page (in this case, page 5). The END command specifies the last page to print. If the END command is not included, the job prints from page 5 through the end of the document.

If you need to print more than one copy of each page, send the job multiple times using the START and END options to get collated copies. Using the “@PJL SET COPIES = *number of copies*” command to print multiple copies of a selected page causes unexpected results because the printer counts physical pages, not multi-copy collated pages.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Printing selected pages <CR><LF>
@PJL JOB START = 5 END = 8 <CR><LF>
  <ESC>%-12345X@PJL <CR><LF>
  @PJL ENTER LANGUAGE = PCL <CR><LF>
  <ESC>E . . . PCL print job . . .<ESC>E
  ⮐<ESC>%-12345X
⮐<ESC>%-12345X@PJL <CR><LF>
@PJL EOJ <CR><LF>
<ESC>%-12345X
```

Spooler Job That Prints a Banner Page Followed by an Application-Generated Job (Application specifies printer language)

The following example demonstrates a spooling application that prints a banner page, and then prints a PostScript job. The application that produced the print file specifies the printer language.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT Spooling Job with Banner <CR><LF>
@PJL JOB NAME = "Spooler #1" <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E . . . Banner Page Data . . . <ESC>E
↩<ESC>%-12345X
  ↩<ESC>%-12345X@PJL <CR><LF>
  @PJL ENTER LANGUAGE = POSTSCRIPT <CR><LF>
  %!PS-ADOBE . . PostScript print data . . ^D
  ↩<ESC>%-12345X
↩<ESC>%-12345X@PJL <CR><LF>
@PJL EOJ <CR><LF>
<ESC>%-12345X
```

Spooler Job That Prints a Banner Page Followed by an Application-Generated Job (Application Does Not Specify Printer Language)

The following example demonstrates a spooling application that prints a banner page. The application was not created with a PJL-ready driver, so it does not begin and end with UEL commands, or specify the printer language—the printer implicitly switches to the correct printer language.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL JOB NAME = "Spooler #2" <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E . . Banner Page Data. .<ESC>E
↩<ESC>%-12345X
   . . . PCL or PostScript print data . . .
↩<ESC>%-12345X@PJL <CR><LF>
@PJL EOJ <CR><LF>
<ESC>%-12345X
```

Requesting Printer Status

When querying the printer for status, the response is not immediate. Wait a fixed amount of time for a response and then time out. If the printer is still working on a previous print job, it may take a while before a response is received.

Your application should be able to discard unexpected status, such as unsolicited status, and discard unrecognizable lines. Lines within the PJL status response begin with a specific keyword, as described in the command description in Chapter 7, and end with the <CR><LF> control codes. Future printers may support new keywords in the PJL status response. Your application should ignore those lines which it does not understand.

Using Status Readback in a Multi-User System

The printing system consists of all components involved in the process of turning an application document into a printed sheet of paper. Common printing system components include the host computer, applications on the host computer, the operating system used by the host computer, the cable connecting the host computer to the printer, and the printer. Other printing system components can include printer sharing boxes, network servers, spoolers running on network servers, and I/O cards installed in the printer. For printer status readback to be useful, all components must be bi-directional.

Some operating system environments, like Microsoft's Windows, provide the components that interact with the printer so Windows applications generally do not need to support printer status readback.

The components that may generate printer queries include the host application, the printer sharing box, the network spooler, and the I/O card installed in the printer. Printer status readback can allow many printing system components to function more effectively, not just the host application. For example, a network I/O card may inject a PJL JOB command at the beginning of each job and a PJL EOJ command at the end of each job. Using unsolicited PJL job status, the I/O card could sent a network packet to an application on the client that supplied the job, notifying the user the job had been printed. Printer status readback allows many printer system components to solve user's needs.

Example Printing System

Figure 11-1 contains an example printing system. The print system contains one I/O-switching LaserJet printer which is connected to seven computers. Host computer #1 is connected via the serial I/O interface. Host computers #2 and #3 are connected through an external printer sharing box that also buffers print job data. The printer sharing box is connected to the printer through the IEEE-1284-compatible I/O interface. Network servers #4 and #5 spool print jobs from network clients #6 and #7.

Although all the network clients and spoolers are connected to the same network cable as the printer, only the two network servers are capable of communicating directly with the printer. In this example, the network clients spool print jobs to a network server; they can not interact directly with the printer.

Given the printing system as shown in Figure 11-1, not all of the printing system components can query the printer and expect a response back.

Printer Status Readback and Printer Sharing

Host computer #1 is directly connected to the printer via the bi-directional serial I/O link. If the software on the host computer supports bi-directional printer communication, applications on host computer #1 can expect the printer to respond to queries. However, at the time an application on host computer #1 requests information, the printer may be processing a print job from a different I/O interface, so the response to host computer #1's query may be delayed, as described in the “Printer Status Readback and Printer I/O Switching” section in this chapter.

Host computers #2 and #3 are connected to the printer via an external printer sharing box that buffers data. If the printer sharing box was not designed to support bi-directional communication with the printer, then applications on host computers #2 and #3 will not be able to receive printer status readback information. However, since the printer sharing box is connected to the printer via the Bi-Tronics I/O interface, which does support bi-directional communication, it is possible for printer sharing boxes to be designed to support printer status readback. In fact, the printer sharing box itself may be able to inject a “print job” to query the printer for specific information.

External printer sharing boxes can be designed to support sending data from the printer to the host computer. However, the printer sharing box has to determine which host computer should receive the

printer's response. The simplest solution for printer sharing boxes is to forward all data received from the printer to all attached host computers, and let the applications on each host computer ignore any impertinent data, as described in the “Handling Unexpected Printer Responses” section in this chapter.

The printer in this example is also attached directly to a network via a network interface card installed into the printer's MIO interface. Network servers #4 and #5 spool print jobs from network clients #6 and #7. In this example, the network clients can not interact directly with the network-attached printer. The network spoolers can inject a “print job” to query the printer and can expect to get responses back. However, for this example, the network operating system does not provide a mechanism which allows applications running on a network client to query the printer and get a response.

The printer's I/O card, the printer sharing box, and the spoolers running on the network servers can query the printer and expect to receive a response since those components are connected directly to the printer (i.e., no other printing system component except for the communication cable is between the printer and those components).

In summary, an application running on host computer #1 can receive printer responses if the operating system on the host computer supports bi-directional communication over the serial I/O interface. The application may have to wait for the printer's response if the printer is processing a job from either the IEEE-1284-compatible I/O interface or the MIO interface.

An application running on host computer #2 or #3 may receive printer responses if the printer sharing box supports bi-directional printer communication. However, since the printer sharing box does not have enough information to route the response to the correct host computer, the printer sharing box can forward all printer responses to all attached host computers and let the application on the host computer ignore any unneeded printer responses.

Applications on network clients #6 and #7 cannot receive any printer responses due to the underlying network operating system. However, the printer sharing box, the I/O card installed in the printer, and spoolers running on network servers #4 and #5 can all query the printer and expect a printer response (although the response will not be immediate if the printer is processing a print job from a different I/O interface).

Printer Status Readback Usage

Applications use printer status readback for two primary purposes (although there are other uses): printer driver configuration and monitoring device status. Since printer configuration does not change often (i.e., the amount of installed printer memory does not change frequently) using printer status readback to assist in initial configuration (or when the printer's configuration changes) is straightforward. If the application determines printer status readback is unavailable (discussed in the “Determining If Printer Status Readback is Available” section), the application can ask the user for the information instead of querying the printer.

The other primary use for printer status readback is to allow applications to monitor the state of the printer. In particular, applications can inform the user when the printer requires intervention (e.g. fill paper trays). If the application enables unsolicited PJL device status, the printer will inform the application whenever the printer's status changes. Since the printer informs the application using unsolicited status, even when the printer is processing a print job from a different I/O interface, the application gets timely printer status information. If printer status readback is unavailable, the application will not be able to provide the user with current printer state information.

Another use for printer status readback is to determine what volatile resources (e.g. soft fonts) are available in the printer right before a print job is sent to the printer. If an application optimizes the printer job using printer status readback (i.e., does not send soft fonts if the printer already has the font), then if printer status readback is unavailable, the application should assume worst case (i.e., the font is not in the printer) when generating print jobs.

In summary, the application should be designed to take advantage of printer status readback, if available, but still function if it is unavailable.

Determining If Printer Status Readback is Available

If the application sends a PJL ECHO command (preceded by the Universal Exit Language command, of course) to the printer and receives the expected response, then the application can assume bi-directional communication with the printer is available and supported solicited status queries will be answered in a timely fashion.

However, under some conditions the application will send, or attempt to send, a PJL ECHO command and not receive a timely response because of one of two reasons: the printer may not be accepting data (due to the printer processing a print job from a different I/O interface or the printer being off-line), or the printing system does not support printer status readback to the application. If the application does not receive a response within three seconds, then the application can assume printer status readback is currently unavailable.

In some printing environments, the application may be able to distinguish between the host operating system not being able to send the query, and the query being sent without receiving a response in a reasonable amount of time. Application developers should not assume that because a query was sent and a response was not received in a timely fashion, that the printer system does not support bi-directional communication. Printer sharing devices may buffer the query and the response may be available, however the data buffered before the query may take more than three seconds to process, delaying the response by more than three seconds.

The application should notify the user that printer status readback is currently unavailable and query the user to determine how to proceed. The common choices are: 1) printer busy, continue retrying until printer status readback is available, 2) printer busy on a long printer job, temporarily do not use printer status readback, or 3) printer status readback unavailable due to host-printer configuration, do not use printer status readback. After obtaining the user's response, the application can continue as appropriate.

Printer Status Readback and Printer I/O Switching

I/O switching occurs when a printer contains more than one I/O interface and accepts data from any interface, based on a first-come first-served basis. Some PJL printers do not support I/O switching.

I/O switching adds complexity to printing solutions taking advantage of printer status readback. If the printer is currently processing a print job from a different I/O interface, applications querying the printer will have to wait for the printer to respond to the query, (or proceed without using printer status readback). The amount of time until the printer provides the response is dependent on the length of the current print job and the length of any other print jobs the printer may process before processing the application's query.

When processing a job, I/O switching paces off all I/O interfaces except for the one which is providing the current print job. However, it is possible for an application to get a few bytes of data into the inactive I/O interface before the printer paces off that I/O interface. If the application times out while trying to send the initial UEL command after one or more bytes of the command are sent, but before the entire UEL command is sent, then the application can proceed using one of the following choices: 1) continue attempting to send the data to the printer, 2) remember how much of the initial UEL command has been sent to the printer and attempt to send the rest of the command at a later time, or 3) stop trying to send the command, making sure the next command the application sends to the printer is the UEL command. This is done so the parser inside the printer properly recognizes all commands following the previously sent partial UEL command. The printer will properly recognize the UEL command, even if the
command appears after a partial UEL command.

For example, assume the initial query is:

```
<ESC>%-12345X@PJL ECHO 08/27/92 09:53:46.5
↩033288925
```

If the printer only accepts "<ESC>%-12", and if the application later sends:

```
<ESC>%-12345X@PJL ECHO 08/27/92 09:57:46.5
↩6202323802 <LF>
```

The printer accepts the query and responds with:

```
@PJL ECHO 08/27/92 09:57:46.5 6202323802<LF>
<FF>
```

One of the conditions I/O-switching printers use to determine when to switch to another I/O interface is the idle time of the I/O interface supplying the current print job. Idle time is defined as the time elapsed since the I/O interface received the last data byte. If the application queries the printer and waits for a response, it is possible for I/O interface idle time to exceed the set timeout value (the TIMEOUT environment variable). When the printer detects the current I/O interface timed out, the printer allows I/O switching and treats any data received over the I/O interface as unrelated to the data previously received over that interface.

To keep the I/O interface from timing out, the application can either send data to the printer more frequently than the timeout setting or can cause the printer to use a different setting by sending a PJL JOB command. When I/O-switching printers receive the PJL JOB command, the printer uses an I/O timeout value equal to ten times the TIMEOUT environment variable setting or five minutes, whichever is greater. (If the application sends the PJL JOB command, the application should send a PJL EOJ command at the end of the job.)

Old Printer Status Readback Responses

Applications need to be designed to handle receiving printer status readback responses that were generated because of an action performed by a different application. For example, a word processing application may send a query to the printer, but because the user turned off the host computer, the application never got a chance to retrieve the response from the printer before the host computer was turned off. When another application, or even the same application at a later time, queries the printer, the first response is the response to the word processing application's query.

The currently executing application should accept old printer status readback responses and discard them until the expected response is received. Applications should include unique information as part of the ECHO command, such as the current time and date and a random number, so that the application can resynchronize with printer status readback responses.

There is also a chance the PJL ECHO response will never by sent by the printer, due to overflowing of the printer's response data buffer as discussed in the following section.

Response Data Buffer Overflow

The printer contains a limited amount of memory. It is possible for an application to fill all available printer memory with printer status readback responses that have not yet been sent to the host computer, simply by sending many queries and never accepting the responses from the printer. Also, if an application enables unsolicited status and never accepts responses, the printer's response data buffer can overflow. The printer limits the amount of memory allotted to hold responses, and when that memory is full (and the host has not recently accepted any responses), the printer discards all future responses until the host accepts the currently queued responses in the printer.

When the printer discards responses, the printer inserts the PJL unsolicited “printer to host data buffer overflow” message:

```
CE
CODE=10010
DISPLAY="00 READY"
```

Note Refer to the “HP LaserJet 4 and 5 Family Comments” section in Appendix A under “Printer Status Readback” for the exact “printer to host buffer overflow” message sent by HP LaserJet 4 and 5 printer families.

The PJL unsolicited “printer to host data buffer overflow” message is always inserted when the printer discards one or more responses, even if unsolicited status is turned off.

I/O-switching printers set aside memory for each I/O interface. A response data buffer overflow on one I/O interface does not mean another I/O interface will also experience the overflow condition. To keep the printer's response data buffer from overflowing, applications should not send more than five queries without accepting the printer's response to those queries.

The application should always send a PJL ECHO command to resynchronize with the printer status readback responses (i.e., get rid of any old responses). However, if the printer's response data buffer is full and the printer is discarding all future responses, then the host will receive a PJL unsolicited “printer to host data buffer overflow” message, but not the PJL ECHO response. Applications must be designed to handle situations where the printer's response data buffer overflows and the printer does not provide the expected response, but instead provides a PJL unsolicited “printer to host data buffer overflow” message. The application should resend all unanswered queries whenever the application receives a PJL unsolicited “printer to host data buffer overflow” message.

Handling Unexpected Printer Responses

Printer sharing devices, like the external printer sharing box or the MIO card inserted into the printer as shown in Figure 11-1, do not have sufficient information to allow the printer sharing device to properly route printer status readback responses to the host computer (the one running the application that queried the printer). In particular, unsolicited PJL status is difficult for the printer sharing

device to properly route since the unsolicited status response may be received by the printer sharing box hours after sending the data from the host computer to the printer that enabled unsolicited status.

Manufacturers of printer sharing devices can choose from the following options to solve this printer-to-host data routing problem.

1 A printer sharing device that is a uni-directional device and does not support printer-to-host data transfer. Applications need to be designed to work with uni-directional printer sharing devices.

2 A printer sharing device that examines the data received from the printer and only forwards solicited responses to the host computer.

A printer sharing device can track which of its I/O interfaces is currently sending data to the printer, and thus know which I/O interface to use when sending solicited printer responses. When the printer sharing device sends data to the printer from a different I/O interface, the printer sharing device must know to the exact byte boundary what printer response data should be sent to the previous I/O interface and what data should be sent to the current I/O interface.

Before the printer sharing device sends the printer data from a different I/O interface than the source of the current print job, the printer sharing device can inject a PJL ECHO command. All solicited printer responses received before the PJL ECHO response should be sent to the previously active I/O interface. All solicited printer responses received after the PJL ECHO response should be sent to the currently active I/O interface. The printer sharing device should consume the PJL ECHO response which was a result of the PJL ECHO command injected by the printer sharing device.

Applications that use unsolicited PJL device, job, page, or timed status need to work properly with printer sharing devices that do not support unsolicited printer-to-host responses.

3 A printer sharing device that can route solicited responses as described in 2 above, plus send all unsolicited responses to all attached host computers. Applications must be designed to properly ignore unexpected printer status readback responses. Ideas on how to design an application to ignore unexpected printer status readback responses are described in the next section.

Application Design Ideas

The previous pages have described various printing system topologies and how components in those topologies can operate so each printer system component can receive printer status readback responses. This section discusses application design ideas that handle the complexities involved with using printer status readback information.

The obvious design approach of querying the printer and waiting for an answer to that query is sure to lead to failure. A busy printer, old printer responses, overflowed printer response buffer, and a uni-directional printing environment all cause the obvious design approach to be inadequate. A better design approach is to treat printer responses as events that cause the application to take some action. Solicited and unsolicited printer status readback queries/responses are discussed separately.

Whenever the application sends a solicited query to the printer, the application should add the query to the “outstanding solicited query” list. Also, if the application can not proceed until the response is received, then a watchdog timer should be set so that some event will be guaranteed to occur in case the application does not receive a timely response. Whenever a solicited response is received, the response should be compared to the list of outstanding solicited queries. If there is no match, then the solicited response should be discarded. If there is a match, then the query should be removed from the outstanding solicited query list, any associated watchdog timer should be disabled, and the application should process the response. If the application was blocked waiting for the response, then the application should become unblocked.

If the application does not need an unsolicited status response, then the application can discard the response.

If the application ever receives the unsolicited PJL “printer to host data buffer overflow” message, then the application should resend all queries in the “outstanding solicited query” list. When the application resends the outstanding solicited queries, it is possible that the application will receive two responses (one generated because of the initial query and one generated because of the resent query). If the application is using an outstanding solicited query list, then when the first response is received, the query will be removed from the list. When the second response is received, the second response will be ignored because there is no matching query in the outstanding solicited query list.

Given the above structure for sending queries and processing responses, applications should adhere to the following guidelines:

1 If the application sends data to the printer in blocks, followed by long pauses between blocks (i.e., greater than five seconds), then it should cause the printer to use a larger I/O interface idle time value by using the PJL JOB command as described in the "Printer Status Readback and Printer I/O Switching" section.

2 Check status readback availability as described in the "Determining if Printer Status Readback is Available" section.

3 Synchronize with the printer-to-host data stream as described in the "Old Printer Status Readback Responses" section.

4 Do not have more than five outstanding queries before accepting printer status readback responses. This prevents response data loss as described in the "Response Data Buffer Overflow" section.

5 Before quitting, turn off all unsolicited status enabled by the application. Also, accept all responses from the printer that were generated because of actions performed by the application.

6 Do not be dependent on the timing characteristics of a single printer model. For example, the response time of the HP LaserJet 4 printer's built-in IEEE-1284-compatible I/O interface will be different than the timing characteristics of a IEEE-1284- compatible interface in an I/O card installed into the printer.

A Product-Specific Feature Support

Introduction

This appendix helps you compare the differences in PJL support for all PJL printers. It includes a list of all the PJL commands, showing which commands are supported by each PJL printer. Also, a list of environment variables shows the range of environment variables supported by each printer. The final portion of the appendix describes some important product-specific information regarding the different Hewlett-Packard printers.

Note For information about products newer than those included in this book, see the *Printer Job Language Technical Reference Addendum*, which includes product-specific information about newer products, as well as commands and variables added to PJL to support these newer products.

PJL Feature Support

The following three tables list the PJL commands and show command support by each printer. "Y" indicates a command is supported; "ns" indicates it is not supported.

Table A-1. PJL Feature Support for HP LaserJet, DeskJet, and PaintJet Printers

PJL Command Name	IIISi	4/4M 4Si 4SiMx	4 Plus 4M Plus 4V, 4MV	4L 5L 6L	4ML	4P 4MP	4PJ 4LJPro 4LC	5P 5MP 6P 6MP	5Si 5SiMx 5Si Mopier	5 5M
COMMENT	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
DEFAULT	ns	Y	Y	Y	Y	Y	Y	Y	Y	Y
DINQUIRE	ns	Y	Y	Y	Y	Y	Y	Y	Y	Y
ECHO	ns	Y	Y	Y	Y	Y	Y	Y	Y	Y
ENTER	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
EOJ	ns	Y	Y	ns	Y	Y	Y	Y	Y	Y
FSAPPEND, FSDIRLIST, FSQUERY, FSUPLOAD	ns	ns	ns	ns	ns	ns	ns	ns	Mopier only	ns
FSDELETE	ns	ns	ns	ns	ns	ns	ns	ns	Y	Y
FSDOWNLOAD	ns	ns	ns	ns	ns	ns	ns	ns	Y	Y
FSINIT	ns	ns	ns	ns	ns	ns	ns	ns	Y	Y
FSMKDIR	ns	ns	ns	ns	ns	ns	ns	ns	Y	Y
INFO	ns	Y[1]	Y	Y[1]	Y	Y	Y	Y	Y	Y
INITIALIZE	ns	Y	Y	Y	Y	Y	Y	Y	Y	Y
INQUIRE	ns	Y	Y	Y	Y	Y	Y	Y	Y	Y
JOB	ns	Y	Y	ns	Y	Y	Y	Y	Y	Y
OPMSG	ns	Y	Y	ns	ns	Y	Y	ns	Y	Y
PJL	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
RDYMSG	ns	Y	Y	ns	ns	Y	Y	ns	Y	Y
RESET	ns	Y	Y	Y	Y	Y	Y	Y	Y	Y
SET	ns	Y	Y	Y	Y	Y	Y	Y	Y	Y
STMSG	ns	Y	Y	ns	ns	Y	Y	ns	Y	Y
UEL	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
USTATUS	ns	Y	Y	Y[2]	Y	Y	Y	Y	Y	Y
USTATUSOFF	ns	Y	Y	Y	Y	Y	Y	Y	Y	Y

1 The LaserJet 4/4M/4L/5L/6L printers support all INFO categories except PAGECOUNT.

2 The LaserJet 4L/5L/6L printers support only the TIMED and DEVICE categories.

Table A-1. PJL Feature Support for HP LaserJet, DeskJet, and PaintJet Printers					
PJL Command Name	**LaserJet 4000 Series 5000 Series**	**Color LJ Color LJ 5/5M**	**DeskJet 1200C**	**DeskJet 1600C**	**PaintJet XL300**
COMMENT	Y	Y	Y	Y	Y
DEFAULT	Y	ns	ns	Y	ns
DINQUIRE	Y	ns	ns	Y	ns
ECHO	Y	Y	ns	Y	ns
ENTER	Y	Y	Y	Y	Y
EOJ	Y	Y	ns	Y[1]	ns
FSAPPEND, FSDIRLIST, FSQUERY, FSUPLOAD	Y	ns	ns	ns	ns
FSDELETE	Y	ns	ns	ns	
FSDOWNLOAD	Y	ns	ns	ns	ns
FSINIT	Y	ns	ns	ns	ns
FSMKDIR	Y	ns	ns	ns	ns
INFO	Y	Y[1]	ns	ns	ns
INITIALIZE	Y	ns	ns	ns	ns
INQUIRE	Y	RET only	ns	ns	ns
JOB	Y	NAME only	ns	Y[2]	ns
OPMSG	Y	ns	ns	ns	ns
PJL	Y	Y	Y	Y	Y
RDYMSG	Y	ns	ns	ns	ns
RESET	Y	ns	ns	Y	ns
SET	Y	RET only	ns	Y	ns
STMSG	Y	ns	ns	ns	ns
UEL	Y	Y	Y	Y	Y
USTATUS	Y	Y[3]	ns	ns	ns
USTATUSOFF	Y	Y	ns	ns	ns

[1] Supports only these INFO categories: CONFIG, ID, PAGECOUNT, USTATUS.

[2] The DeskJet 1600C printer does not support any options for the JOB and EOJ commands.

[3] Supports only these USTATUS categories: DEVICE and JOB.

Table A-1. PJL Feature Support for HP LaserJet, DeskJet, and PaintJet Printers					
PJL Command Name	**LaserJet 1100 Series**	**LaserJet 2100 Series**	**LaserJet 4500 Series**	**LaserJet 8000/8100**	**LaserJet 8500 Series**
COMMENT	Y	Y	Y	Y	Y
DEFAULT	Y	Y	Y	Y	Y
DINQUIRE	Y	Y	Y	Y	Y
ECHO	Y	Y	Y	Y	Y
ENTER	Y	Y	Y	Y	Y
EOJ	ns	Y	Y	Y	Y
FSAPPEND, FSDIRLIST, FSQUERY, FSUPLOAD	ns	ns	ns	ns	ns
FSDELETE	ns	ns	ns	ns	ns
FSDOWNLOAD	ns	ns	ns	ns	ns
FSINIT	ns	ns	ns	ns	ns
FSMKDIR	ns	ns	ns	ns	ns
INFO	Y[1]	Y	Y	Y	Y
INITIALIZE	Y[3]	Y	Y	Y	Y
INQUIRE	Y	Y	Y	Y	Y
JOB	ns	Y	Y	Y	Y
OPMSG	ns	ns	Y	Y	Y
PJL	Y	Y	Y	Y	Y
RDYMSG	ns	ns	Y	Y	Y
RESET	Y	Y	Y	Y	Y
SET	Y	Y	Y	Y	Y
STMSG	ns	ns	Y	Y	Y
UEL	Y	Y	Y	Y	Y
USTATUS	Y[2]	Y	Y	Y	Y
USTATUSOFF	Y	Y	Y	Y	Y

[1] The LaserJet 1100 Series printers support all INFO categories except PAGECOUNT. Sending the INFO VARIABLES command also returns COPYPAGECOUNT and SCANPAGECOUNT as well as PRINTPAGECOUNT.

[2] The LaserJet 1100 Series printers support only the TIMED and DEVICE categories. The USTATUS default is off.

[3] The LaserJet 1100 Series printers do not set default and current PJL variable values to factory defaults for SYMSET and PAPER.

Table A-1. PJL Feature Support for HP DesignJet Printers/Plotters					
PJL Command Name	**200, 220**	**230, 250C, 330, 350C, 430, 450C, 455CA, 488CA**	**600**	**650C**	**700, 750C Plus, 750C, 755CM, 2000CP, 2500CP, 1050C, 1055CM, 3000CP, 3500CP**
COMMENT	Y	Y	Y	Y	Y
DEFAULT	ns	ns	ns	ns	ns
DINQUIRE	ns	ns	ns	ns	ns
ECHO	Y	Y	Y	Y	Y
ENTER	Y[1]	Y[1]	Y[1]	Y[1]	Y[1]
EOJ	ns	Y	ns	ns	Y
FSDELETE	ns	ns	ns	ns	ns
FSDOWNLOAD	ns	ns	ns	ns	ns
FSINIT	ns	ns	ns	ns	ns
FSMKDIR	ns	ns	ns	ns	ns
INFO	Y[2]	Y[2]	Y[2]	Y[2]	Y[2]
INITIALIZE	ns	ns	ns	ns	ns
INQUIRE	ns	ns	ns	ns	ns
JOB	ns	Y	ns	ns	Y
OPMSG	ns	ns	ns	ns	ns
PJL	ns	ns	ns	ns	ns
RDYMSG	ns	ns	ns	ns	ns
RESET	ns	Y	ns	ns	Y
SET	ns	Y[3]	ns	ns	Y[3]
STMSG	ns	ns	ns	ns	ns
UEL	Y	Y	Y	Y	Y
USTATUS	Y[4]	Y[4]	Y[4]	Y[4]	Y[4]
USTATUSOFF	Y	Y	Y	Y	Y

[1] All HP DesignJets support HPGL2. All HP DesignJets except 2000CP, 2500CP, 3000CP and 3500CP support HPGL. HP DesignJets 650C, 700, 750C, 750C Plus, 755CM, 1050C, 1055CM, 2500CP and 3500CP also support PostScript when it is installed.

[2] All DesignJets except the 600 and 650C support only the CONFIG, ID, STATUS, and USTATUS categories. DesignJet 600 and 650C support only the USTATUS configuration.

[3] See the following section for environment variables supported by DesignJets.

[4] All DesignJets support the TIMED and DEVICE categories.

PJL Environment Variable Support

The following tables list all of the current environment variables for PJL, PCL 5 and PostScript, and show the features supported by each printer.

Features for the HP LaserJet, DesignJet, and DeskJet 1600C printers are shown in Tables A-2 through A-5. The table below describes the printers covered in each table.

Table	Pages	Features for these Printers
A-2	A-7 to 17	HP LaserJet 4, 4M, 4 Plus, 4M Plus, 4V, 4MV, 4Si, 4SiMx, 4000 Series, 4L, 4ML, 4P, 4MP
A-3	A-18 to 28	HP LaserJet 4PJ, 4LJ Pro, 4LC, 5L, 6L, 5P, 5MP, 6P, 6MP, 5Si, 5SiMx, 5Si Mopier, HP DeskJet 1600C
A-4	A-29 to 39	HP LaserJet 1100 Series, 2100 Series, 5000 Series, 8000 Series, 8100 Series, Color LaserJet 4500 Series, 8500 Series
A-5	A-40 to 43	HP DesignJet printers

The letters “Y” and “ns” indicate the feature is supported and not supported, respectively. A value in parentheses ( ) indicates that value is the factory default. The letters “RO” indicate it is supported as a read only variable. Printers that do not support the SET or DEFAULT commands, such as the LaserJet IIISi printer, do not support any environment variables.

Table A-2. PJL Environment Variables for HP LaserJet Printers									
Environment Variable	**Variable Values**	**4 4M**	**4 Plus 4M Plus**	**4V 4MV**	**4Si 4SiMx**	**4000 Series**	**4L**	**4ML**	**4P 4MP**
AUTOCONT[1]	(OFF)	RO	RO	RO	RO	Y	Y[1]	Y[1]	Y[1]
	ON	RO	RO	RO	RO	(Y)	Y[1]	Y[1]	Y[1]
AUTOSELECT	(ON)	ns	ns	ns	ns	ns	ns	ns	ns
	OFF	ns	ns	ns	ns	ns	ns	ns	ns
BINDING	(LONGEDGE)	ns	Y	ns	Y	Y	ns	ns	ns
	SHORTEDGE	ns	Y	ns	Y	Y	ns	ns	ns
BITSPERPIXEL	1 or (2)	ns	ns	ns	ns	Y	ns	ns	ns
CLEARABLE-WARNINGS[1]	JOB	RO	RO	RO	RO	(Y)	ns	ns	Y[1]
	(ON)	RO	RO	RO	RO	Y	ns	ns	Y[1]
CONTEXT-SWITCH	(ON)	ns	ns	ns	ns	ns	ns	ns	ns
	OFF	ns	ns	ns	ns	ns	ns	ns	ns
COPIES	(1) to 999	Y	Y	Y	Y	Y	Y	Y	Y
COURIER	(REGULAR)	ns	ns	ns	ns	Y	ns	ns	ns
	DARK	ns	ns	ns	ns	Y	ns	ns	ns
CPLOCK[2]	(OFF)	ns	Y	Y	Y	Y	ns	ns	ns
	ON	ns	Y	Y	Y	Y	ns	ns	ns
	MINIMUM	ns	ns	ns	ns	Y	ns	ns	ns
	MODERATE	ns	ns	ns	ns	Y	ns	ns	ns
	MAXIMUM	ns	ns	ns	ns	Y	ns	ns	ns
DENSITY[1]	1 to 5 (3)	RO	RO	ns	ns	Y[1]	Y[1]	Y[1]	Y[1]
DISKLOCK[2]	(OFF)	ns	ns	Y	ns	Y	ns	ns	ns
	ON	ns	ns	Y	ns	Y	ns	ns	ns
DUPLEX	(OFF)	ns	Y	ns	Y	Y	ns	ns	ns
	ON	ns	Y	ns	Y	Y	ns	ns	ns
ECONOMODE	(OFF)	ns	Y	Y	ns	Y	Y	Y	Y
	ON	ns	Y	Y	ns	Y	Y	Y	Y
FINISH	(NONE)	ns	ns	ns	ns	ns	ns	ns	ns
	STAPLE	ns	ns	ns	ns	ns	ns	ns	ns
FORMLINES	5 to 128 (60)	Y	Y	Y	Y	Y	Y	Y	Y

[1] When a SET or DEFAULT command is used with the AUTOCONT, CLEARABLEWARNINGS, or DENSITY variables, both the User Default and PJL Current Environment settings are modified (except for the LaserJet 4L, 5L, and 6L printers). It is recommended these variables not be changed on a job-by-job basis.

[2] Only modifiable using the DEFAULT command.

Table A-2. PJL Environment Variables for HP LaserJet Printers									
Environment Variable	**Variable Values**	**4 4M**	**4 Plus 4M Plus**	**4V 4MV**	**4Si 4SiMx**	**4000 Series**	**4L**	**4ML**	**4P 4MP**
HOLD	(OFF)	ns	ns	ns	ns	ns	ns	ns	ns
	ON	ns	ns	ns	ns	ns	ns	ns	ns
	PROOF	ns	ns	ns	ns	ns	ns	ns	ns
	STORE	ns	ns	ns	ns	ns	ns	ns	ns
	JOB	ns	ns	ns	ns	ns	ns	ns	ns
HOLDKEY	(""), 0000 to 9999	ns	ns	ns	ns	ns	ns	ns	ns
HOLDTYPE	(PUBLIC)	ns	ns	ns	ns	ns	ns	ns	ns
	PRIVATE	ns	ns	ns	ns	ns	ns	ns	ns
IMAGEADAPT	(AUTO)	ns	ns	ns	ns	ns	Y	ns	ns
	OFF	ns	ns	ns	ns	ns	Y	ns	ns
	ON	ns	ns	ns	ns	ns	Y	ns	ns
INTRAY1	(UNLOCKED)	RO	RO	RO	RO	ns	ns	ns	ns
	LOCKED	RO	RO	RO	RO	ns	ns	ns	ns
INTRAY2	(UNLOCKED)	RO	RO	RO	RO	ns	ns	ns	ns
	LOCKED	RO	RO	RO	RO	ns	ns	ns	ns
INTRAY3	(UNLOCKED)	RO	RO	RO	ns	ns	ns	ns	ns
	LOCKED	RO	RO	RO	ns	ns	ns	ns	ns
INTRAY1SIZE	(LETTER)	RO	RO	RO	RO	RO	ns	ns	ns
	LEGAL	RO	RO	RO	RO	RO	ns	ns	ns
	A4	RO	RO	RO	RO	RO	ns	ns	ns
	EXECUTIVE	RO	RO	RO	RO	RO	ns	ns	ns
	LEDGER	ns	ns	RO	ns	ns	ns	ns	ns
	A3	ns	ns	RO	ns	ns	ns	ns	ns
	JISB4	ns	ns	RO	ns	ns	ns	ns	ns
	JISB5	ns	ns	RO	ns	RO	ns	ns	ns
	CUSTOM	ns	ns	RO	ns	RO	ns	ns	ns
	COM10	RO	RO	RO	ns	RO	ns	ns	ns
	MONARCH	RO	RO	RO	ns	RO	ns	ns	ns
	C5, DL	RO	RO	RO	ns	RO	ns	ns	ns
	B5	RO	RO	RO	ns	RO	ns	ns	ns
	JPOST	ns	ns	RO	ns	ns	ns	ns	ns
	JPOSTD	ns	ns	RO	ns	ns	ns	ns	ns
	A5	ns	ns	ns	ns	RO	ns	ns	ns

Table A-2. PJL Environment Variables for HP LaserJet Printers									
Environment Variable	**Variable Values**	**4 4M**	**4 Plus 4M Plus**	**4V 4MV**	**4Si 4SiMx**	**4000 Series**	**4L**	**4ML**	**4P 4MP**
INTRAY2SIZE	(LETTER)	RO	RO	RO	RO	RO	ns	ns	ns
	LEGAL	RO	RO	RO	RO	RO	ns	ns	ns
	A4	RO	RO	RO	RO	RO	ns	ns	ns
	EXECUTIVE	RO	RO	ns	RO	RO	ns	ns	ns
	LEDGER	ns	ns	RO	ns	ns	ns	ns	ns
	A3	ns	ns	RO	ns	ns	ns	ns	ns
	JISB4	ns	ns	RO	ns	ns	ns	ns	ns
	JISB5	ns	ns	RO	ns	RO	ns	ns	ns
	CUSTOM	ns	ns	ns	ns	RO	ns	ns	ns
	A5	ns	ns	ns	ns	ns	ns	ns	ns
	COM10	ns	ns	ns	ns	ns	ns	ns	ns
INTRAY3SIZE	(LETTER)	RO	RO	RO	ns	RO	ns	ns	ns
	LEGAL	RO	RO	RO	ns	RO	ns	ns	ns
	A4	RO	RO	RO	ns	RO	ns	ns	ns
	EXECUTIVE	RO	RO	ns	ns	RO	ns	ns	ns
	COM10, DL	ns	RO	ns	RO	ns	ns	ns	ns
	MONARCH	ns	RO	ns	RO	ns	ns	ns	ns
	LEDGER	ns	ns	RO	ns	ns	ns	ns	ns
	A3, JISB4	ns	ns	RO	ns	ns	ns	ns	ns
	JISB5	ns	ns	ns	ns	RO	ns	ns	ns
	CUSTOM	ns	ns	ns	ns	RO	ns	ns	ns
INTRAY4SIZE	(COM10)	RO	RO	ns	ns	RO	ns	ns	ns
	MONARCH	RO	RO	ns	ns	RO	ns	ns	ns
	C5, DL, B5	RO	RO	ns	ns	RO	ns	ns	ns
	JPOSTD	ns	ns	ns	ns	ns	ns	ns	ns
INTRAY5SIZE	LETTER	ns	ns	ns	ns	RO	ns	ns	ns
	LEGAL	ns	ns	ns	ns	RO	ns	ns	ns
	A4	ns	ns	ns	ns	RO	ns	ns	ns
	A3	ns	ns	ns	ns	ns	ns	ns	ns
	LEDGER	ns	ns	ns	ns	ns	ns	ns	ns
	JISB4	ns	ns	ns	ns	ns	ns	ns	ns
	EXEC	ns	ns	ns	ns	RO	ns	ns	ns
	JISB5	ns	ns	ns	ns	RO	ns	ns	ns
	CUSTOM	ns	ns	ns	ns	RO	ns	ns	ns

Table A-2. PJL Environment Variables for HP LaserJet Printers									
Environment Variable	**Variable Values**	**4 4M**	**4 Plus 4M Plus**	**4V 4MV**	**4Si 4SiMx**	**4000 Series**	**4L**	**4ML**	**4P 4MP**
INTRAY6SIZE	*Tray-dependent*	ns	ns	ns	ns	RO	ns	ns	ns
INTRAY7SIZE	*Tray-dependent*	ns	ns	ns	ns	RO	ns	ns	ns
INTRAY8SIZE	*Tray-dependent*	ns	ns	ns	ns	RO	ns	ns	ns
IOBUFFER[1]	ON	ns	Y	Y	ns	Y	ns	ns	ns
	OFF	ns	Y	Y	ns	Y	ns	ns	ns
	AUTO	ns	Y	Y	ns	(Y)	ns	ns	ns
IOSIZE[1]	10 to max. available memory	ns	Y	Y	ns	Y	ns	ns	ns
JOBATTR	*"attribute string"*	ns	ns	ns	ns	Y	ns	ns	ns
JOBID	(OFF)	ns	ns	ns	ns	ns	ns	ns	ns
	ON	ns	ns	ns	ns	ns	ns	ns	ns
JOBIDVALUE	0 to 65535	ns	ns	ns	ns	ns	ns	ns	ns
JOBNAME	"*jobname string*"	ns	ns	ns	ns	ns	ns	ns	ns
JOBOFFSET	OFF	ns	ns	ns	Y	(Y)	ns	ns	ns
	(ON)	ns	ns	ns	Y	Y	ns	ns	ns
LANG	DANISH	ns	ns	ns	ns	Y	ns	Y	Y
	GERMAN	ns	ns	ns	ns	Y	ns	Y	Y
	ENGLISH	ns	ns	ns	ns	(Y)	ns	(Y)	(Y)
	SPANISH	ns	ns	ns	ns	Y	ns	Y	Y
	FRENCH	ns	ns	ns	ns	Y	ns	Y	Y
	ITALIAN	ns	ns	ns	ns	Y	ns	Y	Y
	DUTCH	ns	ns	ns	ns	Y	ns	Y	Y
	NORWEGIAN	ns	ns	ns	ns	Y	ns	Y	Y
	POLISH	ns	ns	ns	ns	Y	ns	Y	Y
	PORTUGUESE	ns	ns	ns	ns	Y	ns	Y	Y
	FINNISH	ns	ns	ns	ns	Y	ns	Y	Y
	SWEDISH	ns	ns	ns	ns	Y	ns	Y	Y
	TURKISH	ns	ns	ns	ns	Y	ns	Y	Y
	JAPANESE	ns	ns	ns	ns	Y	ns	ns	ns
	CZECH	ns	ns	ns	ns	Y	ns	ns	ns
	HUNGARIAN	ns	ns	ns	ns	Y	ns	ns	ns
	RUSSIAN	ns	ns	ns	ns	Y	ns	ns	ns

[1] The IOBUFFER and IOSIZE variables can only be used with the DEFAULT, DINQUIRE, and INQUIRE commands.

Table A-2. PJL Environment Variables for HP LaserJet Printers									
Environment Variable	**Variable Values**	**4 4M**	**4 Plus 4M Plus**	**4V 4MV**	**4Si 4SiMx**	**4000 Series**	**4L**	**4ML**	**4P 4MP**
LOWTONER	(ON)	RO	ns	ns	ns	ns	ns	ns	ns
	OFF	RO	ns	ns	ns	ns	ns	ns	ns
	(CONTINUE)	ns	RO	RO	RO	Y	ns	ns	ns
	STOP	ns	RO	RO	RO	Y	ns	ns	ns
MANUALFEED	(OFF)	Y	Y	Y	Y	Y	Y	Y	Y
	ON	Y	Y	Y	Y	Y	Y	Y	Y
MEDIASOURCE	TRAY1	ns	ns	ns	ns	ns	ns	ns	ns
	TRAY2	ns	ns	ns	ns	ns	ns	ns	ns
	TRAY3	ns	ns	ns	ns	ns	ns	ns	ns
MEDIATYPE	TRANSPARENCY	ns	ns	ns	ns	ns	ns	ns	ns
	GLOSSY	ns	ns	ns	ns	ns	ns	ns	ns
	SPECIAL	ns	ns	ns	ns	ns	ns	ns	ns
	PAPER	ns	ns	ns	ns	ns	ns	ns	ns
MPTRAY	MANUAL	RO	RO	RO	ns	ns	ns	ns	ns
	CASSETTE	(RO)	RO	RO	ns	Y[1]	ns	ns	ns
	FIRST	RO	(RO)	(RO)	ns	(Y)[1]	ns	ns	ns
ORIENTATION	(PORTRAIT)	Y	Y	Y	Y	Y	Y	Y	Y
	LANDSCAPE	Y	Y	Y	Y	Y	Y	Y	Y
OUTBIN	(UPPER)	ns	ns	ns	Y	Y	ns	ns	ns
	LOWER	ns	ns	ns	Y	ns	ns	ns	ns
OUTBINPROCESS	0 to 255	ns	ns	ns	ns	ns	ns	ns	ns
OUTLINEPOINTSIZE	0 to 999 (72)	ns	ns	ns	ns	Y	ns	ns	ns
OUTTONER	(STOP)	ns	ns	ns	ns	ns	ns	ns	ns
	CONTINUE	ns	ns	ns	ns	ns	ns	ns	ns
PAGEPROTECT	OFF	(Y)	ns	ns	(Y)	ns	Y	Y	Y
	LETTER. LEGAL	Y	ns	ns	Y	ns	ns	Y	Y
	A4	Y	ns	ns	Y	ns	ns	Y	Y
	ON	ns	Y	Y	ns	Y	Y	ns	ns
	AUTO	ns	(Y)	(Y)	ns	(Y)	(Y)	(Y)	(Y)

[1]For LaserJet 4000 series printers, the MPTRAY variable can only be changed using the PJL DEFAULT command.

Table A-2. PJL Environment Variables for HP LaserJet Printers

Environment Variable	Variable Values	4 4M	4 Plus 4M Plus	4V 4MV	4Si 4SiMx	4000 Series	4L	4ML	4P 4MP
PAPER (Letter, Legal, Ledger, A3, A4, Executive, JISB4, and JISB5 are paper sizes; Com10, C5, DL, Monarch, and B5 are envelope sizes; JPOST and JPOSTD are Japanese post card sizes; CUSTOM is for feeding other sizes, such as 3 x 5 cards and labels [for the LaserJet 4V/4MV printer, 11.7" x 17.7" only])	LETTER[4]	(Y)	(Y)	(Y)	(Y)	(Y)	(Y)	(Y)	(Y)
	LEGAL	Y	Y	Y	Y	Y	Y	Y	Y
	A4[4]	Y	Y	Y	Y	Y	Y	Y	Y
	LEDGER	ns	ns	Y	ns	ns	ns	ns	ns
	A3	ns	ns	Y	ns	ns	ns	ns	ns
	JIS B4	ns	ns	Y	ns	ns	ns	ns	ns
	JISB5	ns	ns	Y	ns	Y	ns	ns	ns
	EXECUTIVE	Y	Y	Y	Y	Y	Y	Y	Y
	COM10	Y	Y	Y	Y	Y	Y	Y	Y
	MONARCH, DL	Y	Y	Y	Y	Y	Y	Y	Y
	C5	Y	Y	Y	ns	Y	Y	Y	Y
	B5	Y	Y	Y	ns	Y	Y	Y	Y
	CUSTOM	ns	ns	Y	ns	Y	ns	Y	Y
	JPOST	ns	ns	Y	ns	ns	ns	ns	ns
	JPOSTD	ns	ns	Y	ns	ns	ns	ns	ns
	A5	ns	ns	ns	ns	Y	ns	ns	ns
PARALLEL	SLOW	ns	ns	ns	ns	ns	ns	ns	ns
	FAST	ns	ns	ns	ns	ns	ns	ns	ns
PASSWORD[1]	(0) to 65535	ns	Y	Y	Y	Y	ns	ns	ns
PERSONALITY[2]	AUTO	(Y)	(Y)	(Y)	(Y)	(Y)	ns	(Y)	(Y)
	PCL	Y	Y	Y	Y	Y	ns	Y	Y
	POSTSCRIPT	Y	Y	Y	Y	Y	ns	Y	Y
	ESCP	ns	ns	Y[2,3]	ns	ns	ns	ns	ns
	INSTALLED	ns	ns	ns	ns	ns	ns	ns	ns
PLANESINUSE	(3)	ns	ns	ns	ns	ns	ns	ns	ns
	1	ns	ns	ns	ns	ns	ns	ns	ns
POWERSAVE	ON	ns	Y	Y	Y	(Y)	ns	ns	ns
	OFF	ns	Y	Y	Y	Y	ns	ns	ns

[1] The PASSWORD variable is only supported with the DEFAULT, DINQUIRE, and INQUIRE commands.

[2] For the LaserJet 4PJ printer, PERSONALITY is a port-specific variable. For all other LaserJet printers, personality is not I/O port-specific. Available only if the optional ESC/P personality is installed.

[3] Available only if the optional ESC/P personality is installed.

[4] If configured for metric paper sizes, A4 is the default paper size and DL is the default envelope size.

Table A-2. PJL Environment Variables for HP LaserJet Printers									
Environment Variable	**Variable Values**	**4 4M**	**4 Plus 4M Plus**	**4V 4MV**	**4Si 4SiMx**	**4000 Series**	**4L**	**4ML**	**4P 4MP**
POWERSAVE-TIME	1	ns	ns	ns	ns	ns	ns	ns	ns
	15	ns	Y	Y	Y	Y	ns	ns	ns
	30	ns	(Y)	(Y)	Y	(Y)	ns	ns	ns
	60	ns	Y	Y	(Y)	Y	ns	ns	ns
	120	ns	Y	Y	Y	Y	ns	ns	ns
	180	ns	Y	Y	Y	Y	ns	ns	ns
	240	ns	ns	ns	ns	ns	ns	ns	ns
	480	ns	ns	ns	ns	ns	ns	ns	ns
PRINTQUALITY	DRAFT	ns	ns	ns	ns	ns	ns	ns	ns
	NORMAL	ns	ns	ns	ns	ns	ns	ns	ns
	HIGH	ns	ns	ns	ns	ns	ns	ns	ns
QTY	(1) to 999	ns	ns	ns	ns	Y	ns	ns	ns
RENDERMODE	COLOR	ns	ns	ns	ns	ns	ns	ns	ns
	GRAYSCALE	ns	ns	ns	ns	ns	ns	ns	ns
REPRINT	(AUTO)	ns	ns	ns	ns	Y	ns	ns	ns
	ON	ns	ns	ns	ns	Y	ns	ns	ns
	OFF	ns	ns	ns	ns	Y	ns	ns	ns
RESOLUTION	300	Y	Y	Y	Y	Y	ns	(RO)	Y
	600	(Y)	(Y)	(Y)	(Y)	(Y)	ns	ns	(Y)
	1200	ns	ns	ns	ns	Y	ns	ns	ns
RESOURCESAVE[1]	ON	ns	Y	Y	RO	Y	ns	ns	ns
	OFF	ns	Y	Y	RO	(Y)	ns	ns	ns
	AUTO	ns	(Y)	(Y)	RO	Y	ns	ns	ns
RESOURCE-SAVESIZE[1]	0 to maximum available memory (in100 Kbyte increments)	ns	Y	Y	Y	Y	ns	ns	ns
RET	OFF	Y	Y	Y	Y	Y	Y	Y	Y
	LIGHT	Y	Y	Y	ns	Y	Y	Y	Y
	MEDIUM	(Y)	(Y)	(Y)	ns	(Y)	(Y)	(Y)	(Y)
	DARK	Y	Y	Y	ns	Y	Y	Y	Y
	ON	ns	ns	ns	(Y)	ns	ns	ns	ns
TIMEOUT	5 to 300 (15)	Y	Y	Y	Y	Y	ns	Y	Y

[1] These variables can only be used with the DEFAULT, DINQUIRE, and INQUIRE commands. RESOURCESAVESIZE is a personality-specific variable.

Table A-2. PJL Environment Variables for HP LaserJet Printers									
Environment Variable	**Variable Values**	**4 4M**	**4 Plus 4M Plus**	**4V 4MV**	**4Si 4SiMx**	**4000 Series**	**4L**	**4ML**	**4P 4MP**
USERNAME	"*username string*"	ns	ns	ns	ns	ns	ns	ns	ns
WIDEA4	(NO)	ns	ns	ns	ns	Y	ns	ns	ns
	YES	ns	ns	ns	ns	Y	ns	ns	ns
PCL-Specific Variables									
FONTNUMBER	(0) to n (maxi-mum value depends on the currently set font source)	Y	Y	Y	Y	Y	Y	Y	Y
FONTSOURCE	(I)	Y	Y	Y	Y	Y	Y	Y	Y
	M1,M2,M3 . . Mn	Y	Y	Y	Y	Y	ns	ns	Y
	C	Y	Y	ns	ns	ns	ns	ns	ns
	C1	ns	ns	ns	Y	ns	ns	ns	ns
	C2	ns	ns	ns	Y	ns	ns	ns	ns
	S	Y	Y	Y	Y	Y	Y	Y	Y
LINETERMINATION	(0), 1, 2, 3	ns	ns	ns	ns	ns	ns	ns	ns
PITCH	0.44 to 99.99 (10.00)	Y	Y	Y	Y	Y	Y	Y	Y
PTSIZE	4.00 to 999.75 (12.00)	Y	Y	Y	Y	Y	Y	Y	Y

Table A-2. PJL Environment Variables for HP LaserJet Printers									
Environment Variable	**Variable Values**	**4 4M**	**4 Plus 4M Plus**	**4V 4MV**	**4Si 4SiMx**	**4000 Series**	**4L**	**4ML**	**4P 4MP**
SYMSET (continued on the following pages)	DESKTOP	Y	Y	Y	Y	Y	Y	Y	Y
	ISO4	Y	Y	Y	Y	Y	Y	Y	Y
	ISO6	Y	Y	Y	Y	Y	Y	Y	Y
	ISO11	Y	Y	Y	Y	Y	Y	Y	Y
	ISO15	Y	Y	Y	Y	Y	Y	Y	Y
	ISO17	Y	Y	Y	Y	Y	Y	Y	Y
	ISO21	Y	Y	Y	Y	Y	Y	Y	Y
	ISO60	Y	Y	Y	Y	Y	Y	Y	Y
	ISO69	Y	Y	Y	Y	Y	Y	Y	Y
	ISOL1	Y	Y	Y	Y	Y	Y	Y	Y
	ISOL2	Y	Y	Y	Y	Y	Y	Y	Y
	ISOL5	Y	Y	Y	Y	Y	Y	Y	Y
	ISOL6	ns	ns	ns	ns	Y	ns	ns	ns
	LEGAL	Y	Y	Y	Y	Y	Y	Y	Y
	MATH8	Y	Y	Y	Y	ns	Y	Y	Y
	MCTEXT	Y	Y	Y	Y	Y	Y	Y	Y
	MSPUBL	Y	Y	Y	Y	ns	Y	Y	Y
	PC775	ns	ns	ns	ns	Y	ns	ns	ns
	PC8	Y	Y	Y	Y	(Y)	Y	Y	Y
	PC850	Y	Y	Y	Y	Y	Y	Y	Y
	PC852	Y	Y	Y	Y	Y	Y	Y	Y
	PC8DN	Y	Y	Y	Y	Y	Y	Y	Y
	PC8TK	Y	Y	Y	Y	Y	Y	Y	Y
	PC1004	ns	ns	ns	ns	Y	ns	ns	ns
	PIFONT	Y	Y	Y	Y	ns	Y	Y	Y
	PSMATH	Y	Y	Y	Y	ns	Y	Y	Y
	PSTEXT	Y	Y	Y	Y	Y	Y	Y	Y
	ROMAN8	(Y)	(Y)	(Y)	(Y)	Y	(Y)	(Y)	(Y)

Table A-2. PJL Environment Variables for HP LaserJet Printers									
Environment Variable	**Variable Values**	**4 4M**	**4 Plus 4M Plus**	**4V 4MV**	**4Si 4SiMx**	**4000 Series**	**4L**	**4ML**	**4P 4MP**
SYMSET continued	VNINTL	Y	Y	Y	Y	ns	Y	Y	Y
	VNMATH	Y	Y	Y	Y	ns	Y	Y	Y
	VNUS	Y	Y	Y	Y	ns	Y	Y	Y
	WIN30	Y	Y	Y	Y	Y	Y	Y	Y
	WINBALT	ns	ns	ns	ns	Y	ns	ns	ns
	WINL1	Y	Y	Y	Y	Y	Y	Y	Y
	WINL2	Y	Y	Y	Y	Y	Y	Y	Y
	WINL5	Y	Y	Y	Y	Y	Y	Y	Y
	WIN31J	ns	ns	Y[1]	ns	Y	ns	ns	ns
Port-Specific Variables									
PERSONALITY[2]	ESCP	ns	ns	ns	ns	ns	ns	ns	ns
	PCL	ns	ns	ns	ns	ns	ns	ns	ns
ESC/P-Specific Variables									
CARRIAGE-RETURN	(CR)	ns	ns	Y[1]	ns	ns	ns	ns	ns
	CRLF	ns	ns	Y[1]	ns	ns	ns	ns	ns
CHARACTER-SET	(KANA)	ns	ns	Y[1]	ns	ns	ns	ns	ns
	EG	ns	ns	Y[1]	ns	ns	ns	ns	ns
TOPMARGIN	(TM19MM)	ns	ns	Y[1]	ns	ns	ns	ns	ns
	TM6MM	ns	ns	Y[1]	ns	ns	ns	ns	ns
ANKCONDENSE	ON	ns	ns	Y[1]	ns	ns	ns	ns	ns
	(OFF)	ns	ns	Y[1]	ns	ns	ns	ns	ns
FONT	(MSMINCHO)	ns	ns	Y[1]	ns	ns	ns	ns	ns
	MSGOTHIC	ns	ns	Y[1]	ns	ns	ns	ns	ns

[1] Only present when the optional ESC/P personality is installed

[2] PERSONALITY is only a port-specific variable for the LaserJet 4PJ printer. For all other printers, it is a general variable. For all other printers, see the PERSONALITY variable in the tables on pages B-12, B-23, and B-35.

Table A-2. PJL Environment Variables for HP LaserJet Printers									
Environment Variable	**Variable Values**	**4 4M**	**4 Plus 4M Plus**	**4V 4MV**	**4Si 4SiMx**	**4000 Series**	**4L**	**4ML**	**4P 4MP**
PostScript-Specific Variables1									
ADOBEMBT	OFF	ns	ns	ns	ns	ns	ns	ns	ns
	ON	ns	ns	ns	ns	ns	ns	ns	ns
	(AUTO)	ns	ns	ns	ns	ns	ns	ns	ns
JAMRECOVERY	(OFF)	ns	Y	Y	Y	ns	ns	ns	ns
	ON	ns	Y	Y	Y	ns	ns	ns	ns
PRTPSERRS	(OFF)	Y	Y	Y	Y	Y	ns	Y	Y
	ON	Y	Y	Y	Y	Y	ns	Y	Y
[1] Provided PostScript is installed. PostScript is an option in some printers.									

Table A-3. PJL Environment Variables for HP LaserJet and DeskJet Printers									
Environment Variable	**Variable Values**	**4PJ 4LJ Pro**	**4 LC**	**5L 6L**	**5P 5MP**	**6P 6MP**	**5Si 5SiMx, Mopier**	**5 5M**	**1600C**
AUTOCONT[1]	(OFF)	Y[1]	Y[1]	Y[1]	Y[2]	Y[2]	Y	RO	ns
	ON	Y[1]	Y[1]	Y[1]	Y[2]	Y[2]	Y	RO	ns
AUTOSELECT	(ON)	ns	ns	ns	ns	ns	ns	ns	Y[3]
	OFF	ns	ns	ns	ns	ns	ns	ns	Y[3]
BINDING	(LONGEDGE)	ns	ns	ns	ns	ns	Y	Y	ns
	SHORTEDGE	ns	ns	ns	ns	ns	Y	Y	ns
BITSPERPIXEL	1 or (2)	ns	ns	ns	ns	ns	ns	ns	ns
CLEARABLE-WARNINGS[1]	JOB	Y[1]	ns	ns	ns	ns	ns	RO	ns
	(ON)	Y[1]	ns	ns	ns	ns	ns	RO	ns
CONTEXT-SWITCH	(ON)	ns	ns	ns	ns	ns	ns	ns	Y[3]
	OFF	ns	ns	ns	ns	ns	ns	ns	Y[3]
COPIES	(1) to 999	Y	Y	Y	Y	Y	Y	Y	Y
COURIER	(REGULAR)	ns	ns	ns	ns	Y	ns	Y	ns
	DARK	ns	ns	ns	ns	Y	ns	Y	ns
CPLOCK[2]	(OFF)	ns	ns	ns	ns	ns	Y	Y	ns
	ON	ns	ns	ns	ns	ns	Y	Y	ns
	MINIMUM	ns	ns	ns	ns	ns	ns	ns	ns
	MODERATE	ns	ns	ns	ns	ns	ns	ns	ns
	MAXIMUM	ns	ns	ns	ns	ns	ns	ns	ns
DENSITY[1]	1 to 5 (3)	Y[1]	Y[1]	Y[1]	Y[2]	Y[2]	Y	RO	ns
DISKLOCK[2]	(OFF)	ns	ns	ns	ns	ns	Y	Y	ns
	ON	ns	ns	ns	ns	ns	Y	Y	ns
DUPLEX	(OFF)	ns	ns	ns	ns	ns	Y	Y	ns
	ON	ns	ns	ns	ns	ns	Y	Y	ns
ECONOMODE	(OFF)	Y	Y	Y	Y	Y	Y	Y	ns
	ON	Y	Y	Y	Y	Y	Y	Y	ns
FINISH	(NONE)	ns	ns	ns	ns	ns	Y[4]	ns	ns
	STAPLE	ns	ns	ns	ns	ns	Y[4]	ns	ns
FORMLINES	5 to 128 (60)	Y	Y	Y	Y	Y	Y	Y	Y

[1] When a SET or DEFAULT command is used with the AUTOCONT, CLEARABLEWARNINGS, or DENSITY variables, both the User Default and PJL Current Environment settings are modified (except for the LaserJet 4L and 5L printers). It is recommended these variables not be changed on a job-by-job basis.

[2] Only modifiable using the DEFAULT command.

[3] DeskJet 1600C — these variables are only available using the DEFAULT and DINQUIRE commands.

[4] The FINISH variable is only supported by the 5Si Mopier.

Table A-3. PJL Environment Variables for HP LaserJet and DeskJet Printers									
Environment Variable	**Variable Values**	**4PJ 4LJ Pro**	**4 LC**	**5L 6L**	**5P 5MP**	**6P 6MP**	**5Si 5SiMx, Mopier**	**5 5M**	**1600C**
HOLD	(OFF)	ns	ns	ns	ns	ns	ns	ns	ns
	ON	ns	ns	ns	ns	ns	ns	ns	ns
	PROOF	ns	ns	ns	ns	ns	ns	ns	ns
	STORE	ns	ns	ns	ns	ns	ns	ns	ns
	JOB	ns	ns	ns	ns	ns	ns	ns	ns
HOLDKEY	(""), 0000 to 9999	ns	ns	ns	ns	ns	ns	ns	ns
HOLDTYPE	(PUBLIC)	ns	ns	ns	ns	ns	ns	ns	ns
	PRIVATE	ns	ns	ns	ns	ns	ns	ns	ns
IMAGEADAPT	(AUTO)	ns	ns	Y	ns	ns	ns	ns	ns
	OFF	ns	ns	Y	ns	ns	ns	ns	ns
	ON	ns	ns	Y	ns	ns	ns	ns	ns
INTRAY1	(UNLOCKED)	ns	ns	ns	ns	ns	ns	RO	Y[1]
	LOCKED	ns	ns	ns	ns	ns	ns	RO	Y[1]
INTRAY2	(UNLOCKED)	ns	ns	ns	ns	ns	ns	RO	ns
	LOCKED	ns	ns	ns	ns	ns	ns	RO	ns
INTRAY3	(UNLOCKED)	ns	ns	ns	ns	ns	ns	RO	Y[1]
	LOCKED	ns	ns	ns	ns	ns	ns	RO	Y[1]
INTRAY1SIZE	(LETTER)	ns	ns	ns	ns	ns	RO	RO	ns
	LEGAL	ns	ns	ns	ns	ns	RO	RO	ns
	A4	ns	ns	ns	ns	ns	RO	RO	ns
	EXECUTIVE	ns	ns	ns	ns	ns	RO	RO	ns
	LEDGER	ns	ns	ns	ns	ns	RO	ns	ns
	A3	ns	ns	ns	ns	ns	RO	ns	ns
	JISB4	ns	ns	ns	ns	ns	RO	ns	ns
	JISB5	ns	ns	ns	ns	ns	RO	ns	ns
	CUSTOM	ns	ns	ns	ns	ns	RO	ns	ns
	COM10	ns	ns	ns	ns	ns	RO	RO	ns
	MONARCH	ns	ns	ns	ns	ns	RO	RO	ns
	C5, DL	ns	ns	ns	ns	ns	RO	RO	ns
	B5	ns	ns	ns	ns	ns	RO	RO	ns
	JPOST	ns	ns	ns	ns	ns	ns	ns	ns
	JPOSTD	ns	ns	ns	ns	ns	RO	ns	ns
	A5	ns	ns	ns	ns	ns	ns	RO	ns

[1] DeskJet 1600C — these variables are only available using the DEFAULT and DINQUIRE commands.

Table A-3. PJL Environment Variables for HP LaserJet and DeskJet Printers									
Environment Variable	**Variable Values**	**4PJ 4LJ Pro**	**4 LC**	**5L 6L**	**5P 5MP**	**6P 6MP**	**5Si 5SiMx, Mopier**	**5 5M**	**1600C**
INTRAY2SIZE	(LETTER)	ns	ns	ns	ns	ns	RO	RO	ns
	LEGAL	ns	ns	ns	ns	ns	RO	RO	ns
	A4	ns	ns	ns	ns	ns	RO	RO	ns
	EXECUTIVE	ns	ns	ns	ns	ns	ns	RO	ns
	LEDGER	ns	ns	ns	ns	ns	ns	ns	ns
	A3	ns	ns	ns	ns	ns	ns	ns	ns
	JISB4	ns	ns	ns	ns	ns	ns	ns	ns
	JISB5	ns	ns	ns	ns	ns	ns	ns	ns
	CUSTOM	ns	ns	ns	ns	ns	ns	ns	ns
	A5	ns	ns	ns	ns	ns	ns	ns	ns
	COM10	ns	ns	ns	ns	ns	ns	ns	ns
INTRAY3SIZE	(LETTER)	ns	ns	ns	ns	ns	RO	RO	ns
	LEGAL	ns	ns	ns	ns	ns	RO	RO	ns
	A4	ns	ns	ns	ns	ns	RO	RO	ns
	EXECUTIVE	ns	ns	ns	ns	ns	ns	RO	ns
	COM10, DL	ns	ns	ns	ns	ns	ns	ns	ns
	MONARCH	ns	ns	ns	ns	ns	ns	ns	ns
	LEDGER	ns	ns	ns	ns	ns	RO	ns	ns
	A3, JISB4	ns	ns	ns	ns	ns	RO	ns	ns
	JISB5	ns	ns	ns	ns	ns	ns	ns	ns
	CUSTOM	ns	ns	ns	ns	ns	ns	ns	ns
INTRAY4SIZE	(COM10)	ns	ns	ns	ns	ns	RO	RO	ns
	MONARCH	ns	ns	ns	ns	ns	RO	RO	ns
	C5, DL, B5	ns	ns	ns	ns	ns	RO	RO	ns
	JPOSTD	ns	ns	ns	ns	ns	RO	ns	ns
INTRAY5SIZE	LETTER	ns	ns	ns	ns	ns	RO	ns	ns
	LEGAL	ns	ns	ns	ns	ns	RO	ns	ns
	A4	ns	ns	ns	ns	ns	RO	ns	ns
	A3	ns	ns	ns	ns	ns	RO	ns	ns
	LEDGER	ns	ns	ns	ns	ns	RO	ns	ns
	JISB4	ns	ns	ns	ns	ns	RO	ns	ns
	EXEC	ns	ns	ns	ns	ns	ns	ns	ns
	JISB5	ns	ns	ns	ns	ns	ns	ns	ns
	CUSTOM	ns	ns	ns	ns	ns	ns	ns	ns

Table A-3. PJL Environment Variables for HP LaserJet and DeskJet Printers									
Environment Variable	**Variable Values**	**4PJ 4LJ Pro**	**4 LC**	**5L 6L**	**5P 5MP**	**6P 6MP**	**5Si 5SiMx, Mopier**	**5 5M**	**1600C**
INTRAY6SIZE	*Tray-dependent*	ns	ns	ns	ns	ns	ns	ns	ns
INTRAY7SIZE	*Tray-dependent*	ns	ns	ns	ns	ns	ns	ns	ns
INTRAY8SIZE	*Tray-dependent*	ns	ns	ns	ns	ns	ns	ns	ns
IOBUFFER [1]	ON	ns	ns	ns	Y	Y	(Y)	Y	ns
	OFF	ns	ns	Y	Y	Y	Y	Y	ns
	AUTO	ns	ns	(Y)	Y	Y	Y	(Y)	ns
IOSIZE[1]	10–max. memory	ns	ns	ns	Y	Y	Y	Y	ns
JOBATTR	*"attribute string"*	ns	ns	ns	ns	ns	Y	Y	ns
JOBID	(OFF)	ns	ns	ns	ns	ns	ns	ns	ns
	ON	ns	ns	ns	ns	ns	ns	ns	ns
JOBIDVALUE	0 to 65535	ns	ns	ns	ns	ns	ns	ns	ns
JOBNAME	"*jobname string*"	ns	ns	ns	ns	ns	ns	ns	ns
JOBOFFSET	OFF	ns	ns	ns	ns	ns	Y	ns	ns
	(ON)	ns	ns	ns	ns	ns	Y	ns	ns
LANG	DANISH	ns	ns	ns	Y	Y	Y	ns	ns
	GERMAN	ns	ns	ns	Y	Y	Y	ns	ns
	ENGLISH	Y	Y	ns	(Y)	(Y)	(Y)	ns	ns
	SPANISH	ns	ns	ns	Y	Y	Y	ns	ns
	FRENCH	ns	ns	ns	Y	Y	Y	ns	ns
	ITALIAN	ns	ns	ns	Y	Y	Y	ns	ns
	DUTCH	ns	ns	ns	Y	Y	Y	ns	ns
	NORWEGIAN	ns	ns	ns	Y	Y	Y	ns	ns
	POLISH	ns	ns	ns	Y	Y	Y	ns	ns
	PORTUGUESE	ns	ns	ns	Y	Y	Y	ns	ns
	FINNISH	ns	ns	ns	Y	Y	Y	ns	ns
	SWEDISH	ns	ns	ns	Y	Y	Y	ns	ns
	TURKISH	ns	ns	ns	Y	Y	Y	ns	ns
	JAPANESE	(Y)	ns	ns	ns	ns	Y	ns	ns
	CHINESE	ns	(Y)	ns	ns	ns	ns	ns	ns
	CZECH	ns	ns	ns	ns	ns	ns	ns	ns
	HUNGARIAN	ns	ns	ns	ns	ns	ns	ns	ns
	RUSSIAN	ns	ns	ns	ns	ns	ns	ns	ns

[1] The IOBUFFER and IOSIZE variables can only be used with the DEFAULT, DINQUIRE, and INQUIRE commands.

Table A-3. PJL Environment Variables for HP LaserJet and DeskJet Printers									
Environment Variable	**Variable Values**	**4PJ 4LJ Pro**	**4 LC**	**5L 6L**	**5P 5MP**	**6P 6MP**	**5Si 5SiMx, Mopier**	**5 5M**	**1600C**
LOWTONER	(ON)	ns	ns	ns	ns	ns	ns	ns	ns
	OFF	ns	ns	ns	ns	ns	ns	ns	ns
	(CONTINUE)	ns	ns	ns	ns	ns	Y	RO	ns
	STOP	ns	ns	ns	ns	ns	Y	RO	ns
MANUALFEED	(OFF), ON	Y	Y	Y	Y	Y	Y	Y	ns
MEDIASOURCE	TRAY1	ns	ns	ns	ns	ns	ns	ns	Y[1]
	TRAY2	ns	ns	ns	ns	ns	ns	ns	ns
	TRAY3	ns	ns	ns	ns	ns	ns	ns	Y[1]
MEDIATYPE	TRANSPARENCY	ns	ns	ns	ns	ns	ns	ns	Y
	GLOSSY	ns	ns	ns	ns	ns	ns	ns	Y
	SPECIAL	ns	ns	ns	ns	ns	ns	ns	Y
	PAPER	ns	ns	ns	ns	ns	ns	ns	Y
MPTRAY	MANUAL	ns	ns	ns	Y[2]	ns	ns	ns	ns
	CASSETTE	ns	ns	ns	Y[2]	Y[2]	ns	RO	ns
	FIRST	ns	ns	ns	Y[2]	Y[2]	ns	RO	ns
ORIENTATION	(PORTRAIT)	Y	Y	Y	Y	Y	Y	Y	Y
	LANDSCAPE	Y	Y	Y	Y	Y	Y	Y	Y
OUTBIN	(UPPER)	ns	ns	ns	ns	ns	Y	ns	ns
	LOWER	ns	ns	ns	ns	ns	Y	ns	ns
	OPTIONALOUT PUTBIN1 . . . 62	ns	ns	ns	ns	ns	Y	ns	ns
OUTBINPROCESS	0 to 255	ns	ns	ns	ns	ns	ns	ns	ns
OUTLINEPOINTSIZE	0 to 999 (72)	ns	ns	ns	ns	ns	ns	ns	ns
OUTTONER	(STOP)	ns	ns	ns	ns	ns	ns	ns	ns
	CONTINUE	ns	ns	ns	ns	ns	ns	ns	ns
PAGEPROTECT	OFF	Y	Y	Y	ns	ns	ns	ns	(Y)
	LETTER, LEGAL	Y	Y	ns	ns	ns	ns	ns	Y
	A4	Y	Y	ns	ns	ns	ns	ns	Y
	ON	ns	ns	Y	Y	Y	Y	Y	ns
	AUTO	(Y)	(Y)	(Y)	(Y)	(Y)	Y	(Y)	ns

[1] DeskJet 1600C — these variables are only available using the DEFAULT and DINQUIRE commands.

[2] For the LaserJet 5P/5MP printers, the MPTRAY variable can only be changed using the PJL DEFAULTcommand. The LaserJet 6P/6MP printers allow both the DEFAULT and SET commands.

Table A-3. PJL Environment Variables for HP LaserJet and DeskJet Printers

Environment Variable	Variable Values	4PJ 4LJ Pro	4 LC	5L 6L	5P 5MP	6P 6MP	5Si 5SiMx, Mopier	5 5M	1600C
PAPER (Letter, Legal, Ledger, A3, A4, Executive, JISB4, and JISB5 are paper sizes; Com10, C5, DL, Monarch, and B5 are envelope sizes; JPOST and JPOSTD are Japanese post card sizes; CUSTOM is for feeding other sizes, such as 3 x 5 cards and labels [for the LaserJet 4V/4MV printer, 11.7" x 17.7" only])	LETTER	Y	Y	(Y)	(Y)	(Y)	Y	(Y)	(Y)
	LEGAL	Y	Y	Y	Y	Y	Y	Y	Y
	A4	(Y)	(Y)	Y	Y	Y	Y	Y	Y
	LEDGER	ns	ns	ns	ns	ns	Y	ns	ns
	A3	ns	ns	ns	ns	ns	Y	ns	ns
	JIS B4	ns	ns	ns	ns	ns	Y	ns	ns
	JISB5	Y	Y	ns	ns	Y	Y	ns	ns
	EXECUTIVE	Y	Y	Y	Y	Y	Y	Y	ns
	COM10	Y	Y	Y	Y	Y	Y	Y	ns
	MONARCH, DL	Y	Y	Y	Y	Y	Y	Y	ns
	C5	Y	Y	Y	Y	Y	Y	Y	ns
	B5	Y	Y	Y	Y	Y	Y	Y	ns
	CUSTOM	Y	Y	ns	Y	Y	Y	ns	ns
	JPOST	Y	Y	ns	ns	Y	ns	ns	ns
	JPOSTD	Y	Y	ns	ns	Y	Y	ns	ns
	A5	ns	ns	ns	ns	Y	ns	Y	ns
PARALLEL	SLOW	ns	ns	ns	ns	ns	ns	ns	Y[2]
	FAST	ns	ns	ns	ns	ns	ns	ns	Y[2]
PASSWORD[1]	(0) to 65535	ns	ns	ns	Y	Y	Y	Y	ns
PERSONALITY[3]	AUTO	ns	ns	ns	(Y)	(Y)	Y	(Y)	ns
	PCL	Y	(Y)	(Y)	Y	Y	Y	Y	Y[2]
	POSTSCRIPT	ns	ns	ns	Y	Y	Y	Y	Y[2]
	ESCP	(Y)[3]	ns	ns	ns	ns	Y	ns	ns
	INSTALLED	ns	ns	ns	ns	ns	ns	ns	(Y)
PLANESINUSE	(3)	ns	ns	ns	ns	ns	ns	ns	ns
	1	ns	ns	ns	ns	ns	ns	ns	ns
POWERSAVE	(ON)	ns	ns	ns	ns	ns	Y	Y	Y[2]
	OFF	ns	ns	ns	ns	ns	Y	Y	Y[2]

[1] The PASSWORD variable is only available using the DEFAULT, DINQUIRE and INQUIRE commands.

[2] DeskJet 1600C — these variables are only available using the DEFAULT and DINQUIRE commands.

[3] For the LaserJet 4PJ printer, PERSONALITY is a port-specific variable. For all other LaserJet printers, personality is not I/O port-specific.

Table A-3. PJL Environment Variables for HP LaserJet and DeskJet Printers									
Environment Variable	**Variable Values**	**4PJ 4LJ Pro**	**4 LC**	**5L 6L**	**5P 5MP**	**6P 6MP**	**5Si 5SiMx, Mopier**	**5 5M**	**1600C**
POWERSAVE-TIME	1	ns	ns	ns	ns	ns	ns	ns	ns
	15	ns	ns	ns	ns	ns	Y	Y	Y[1]
	30	ns	ns	ns	ns	ns	Y	(Y)	(Y)[1]
	60	ns	ns	ns	ns	ns	(Y)	Y	Y[1]
	120	ns	ns	ns	ns	ns	Y	Y	Y[1]
	180	ns	ns	ns	ns	ns	Y	Y	Y[1]
	240	ns	ns	ns	ns	ns	ns	ns	ns
	480	ns	ns	ns	ns	ns	ns	ns	ns
PRINTQUALITY	DRAFT	ns	ns	ns	ns	ns	ns	ns	Y[1]
	NORMAL	ns	ns	ns	ns	ns	ns	ns	Y[1]
	HIGH	ns	ns	ns	ns	ns	ns	ns	Y[1]
QTY	(1) to 999	ns	ns	ns	ns	ns	Y[3]	ns	ns
RENDERMODE	COLOR	ns	ns	ns	ns	ns	ns	ns	Y[1]
	GRAYSCALE	ns	ns	ns	ns	ns	ns	ns	Y[1]
REPRINT	(AUTO)	ns	ns	ns	ns	Y	ns	ns	ns
	ON	ns	ns	ns	ns	Y	ns	ns	ns
	OFF	ns	ns	ns	ns	Y	ns	ns	ns
RESOLUTION	300	Y	Y	Y	Y	Y	Y	Y	(Y)
	600	(Y)	(Y)	(Y)	(Y)	(Y)	(Y)	(Y)	Y
	1200	ns	ns	ns	ns	ns	ns	ns	ns
RESOURCESAVE[2]	ON	ns	ns	ns	Y	Y	Y	Y	ns
	OFF	ns	ns	ns	Y	Y	Y	Y	ns
	AUTO	ns	ns	ns	Y	Y	Y	Y	ns
RESOURCE-SAVESIZE[2]	0–max. available memory (100 Kb increments)	ns	ns	ns	Y	Y	Y	Y	ns
RET	OFF	Y	Y	Y	Y	Y	Y	Y	ns
	LIGHT	Y	Y	ns	Y	Y	ns	Y	ns
	MEDIUM	(Y)	(Y)	ns	(Y)	(Y)	ns	(Y)	ns
	DARK	Y	Y	ns	Y	Y	ns	Y	ns
	ON	ns	ns	(Y)	ns	ns	(Y)	ns	ns

[1] DeskJet 1600C — these variables are only available using the DEFAULT and DINQUIRE commands.

[2] These variables can only be used with the DEFAULT, DINQUIRE, and INQUIRE commands. RESOURCESAVESIZE is a personality-specific variable.

[3] QTY is only supported on the HP LaserJet 5Si Mopier.

Table A-3. PJL Environment Variables for HP LaserJet and DeskJet Printers									
Environment Variable	**Variable Values**	**4PJ 4LJ Pro**	**4 LC**	**5L 6L**	**5P 5MP**	**6P 6MP**	**5Si 5SiMx, Mopier**	**5 5M**	**1600C**
TIMEOUT	5 to 300 (15)	Y	Y	ns	Y	Y	Y	Y	Y[1]
USERNAME	"*username string*"	ns	ns	ns	ns	ns	ns	ns	ns
WIDEA4	(NO)	ns	ns	ns	ns	Y	ns	Y	ns
	YES	ns	ns	ns	ns	Y	ns	Y	ns
PCL-Specific Variables									
FONTNUMBER	(0) to n (max. depends on the font source)	Y	Y	Y	Y	Y	Y	Y	ns
FONTSOURCE	(I)	Y	Y	Y	Y	Y	Y	Y	ns
	M1,M2,M3 .. Mn	Y[2]	ns	ns	Y	Y	Y	Y	ns
	C	ns	ns	ns	ns	ns	ns	ns	ns
	C1	ns	ns	ns	ns	ns	ns	ns	ns
	C2	ns	ns	ns	ns	ns	ns	ns	ns
	S	Y	Y	Y	Y	Y	Y	Y	ns
LINETERMINATION	(0), 1, 2, 3	ns	ns	ns	ns	ns	ns	ns	ns
PITCH	0.44 to 99.99 (10.00)	Y	Y	Y	Y	Y	Y	Y	Y[1,3]
PTSIZE	4.00 to 999.75 (12.00)	Y	Y	Y	Y	Y	Y	Y	ns
RESOURCE-SAVESIZE[4]	0–max. available memory (100 Kb increments)	ns	ns	ns	Y	Y	Y	Y	ns

[1] DeskJet 1600C — these variables are only available using the DEFAULT and DINQUIRE commands.
[2] The LaserJet 4JL Pro printer does not support font SIMMs.
[3] The DeskJet 1600C only supports the values 8.00, 10.00, 12.00, 16.67, 18.00, 20.00.
[4] These variables can only be used with the DEFAULT, DINQUIRE, and INQUIRE commands. RESOURCESAVESIZE is a personality-specific variable.

Table A-3. PJL Environment Variables for HP LaserJet and DeskJet Printers									
Environment Variable	**Variable Values**	**4PJ 4LJ Pro**	**4 LC**	**5L 6L**	**5P 5MP**	**6P 6MP**	**5Si 5SiMx, Mopier**	**5 5M**	**1600C**
SYMSET (continued on the following pages)	DESKTOP	Y	Y	Y	Y	Y	Y	Y	Y[1]
	ISO4	Y	Y	Y	Y	Y	Y	Y	Y[1]
	ISO6	Y	Y	Y	Y	Y	Y	Y	Y[1]
	ISO11	Y	Y	Y	Y	Y	Y	Y	Y[1]
	ISO15	Y	Y	Y	Y	Y	Y	Y	Y[1]
	ISO17	Y	Y	Y	Y	Y	Y	Y	Y[1]
	ISO21	Y	Y	Y	Y	Y	Y	Y	Y[1]
	ISO60	Y	Y	Y	Y	Y	Y	Y	Y[1]
	ISO69	Y	Y	Y	Y	Y	Y	Y	Y[1]
	ISOL1	Y	Y	Y	Y	Y	Y	Y	Y[1]
	ISOL2	Y	Y	Y	Y	Y	Y	Y	Y[1]
	ISOL5	Y	Y	Y	Y	Y	Y	Y	Y[1]
	ISOL6	ns	ns	ns	ns	Y	ns	Y	ns
	LEGAL	Y	Y	Y	Y	Y	Y	Y	Y[1]
	MATH8	Y	Y	Y	Y	ns	Y	ns	Y[1]
	MCTEXT	Y	Y	Y	Y	Y	Y	Y	Y
	MSPUBL	Y	Y	Y	Y	ns	Y	ns	Y[1]
	PC775	ns	ns	ns	ns	Y	ns	Y	ns
	PC8	Y	Y	(Y)	Y	(Y)	(Y)	(Y)	Y[1]
	PC850	Y	Y	Y	Y	Y	Y	Y	Y[1]
	PC852	Y	Y	Y	Y	Y	Y	Y	Y[1]
	PC8DN	Y	Y	Y	Y	Y	Y	Y	Y[1]
	PC8TK	Y	Y	Y	Y	Y	Y	Y	Y[1]
	PC1004	ns	ns	ns	ns	Y	ns	Y	ns
	PIFONT	Y	Y	Y	Y	ns	Y	ns	Y[1]
	PSMATH	Y	Y	Y	Y	ns	Y	ns	Y[1]
	PSTEXT	Y	Y	Y	Y	Y	Y	Y	Y[1]
	ROMAN8	Y	Y	Y	(Y)	Y	Y	Y	Y[1]

[1] DeskJet 1600C — these variables are only available using the DEFAULT and DINQUIRE commands.

Table A-3. PJL Environment Variables for HP LaserJet and DeskJet Printers									
Environment Variable	**Variable Values**	**4PJ 4LJ Pro**	**4 LC**	**5L 6L**	**5P 5MP**	**6P 6MP**	**5Si 5SiMx, Mopier**	**5 5M**	**1600C**
SYMSET (continued)	VNINTL	Y	Y	Y	Y	ns	Y	ns	Y[2]
	VNMATH	Y	Y	Y	Y	ns	Y	ns	Y[2]
	VNUS	Y	Y	Y	Y	ns	Y	ns	Y[2]
	WIN30	Y	Y	Y	Y	Y	Y	Y	Y[2]
	WINBALT	ns	ns	ns	ns	Y	ns	Y	ns
	WINL1	Y	Y	Y	Y	Y	Y	Y	Y[2]
	WINL2	Y	Y	Y	Y	Y	Y	Y	Y[2]
	WINL5	Y	Y	Y	Y	Y	Y	Y	Y[2]
	WIN31J	(Y)	ns	ns	ns	ns	Y	ns	ns
	GB2312	ns	(Y)	ns	ns	ns	ns	ns	ns
Port-Specific Variables									
PERSONALITY[1]	ESCP	Y	ns	ns	ns	ns	ns	ns	ns
	PCL	Y	ns	ns	ns	ns	ns	ns	ns
ESC/P-Specific Variables									
CARRIAGE-RETURN	(CR)	Y	ns	ns	ns	ns	Y[3]	ns	ns
	CRLF	Y	ns	ns	ns	ns	Y[3]	ns	ns
CHARACTER-SET	(KANA)	Y	ns	ns	ns	ns	Y[3]	ns	ns
	EG	Y	ns	ns	ns	ns	Y[3]	ns	ns
TOPMARGIN	(TM19MM)	Y	ns	ns	ns	ns	Y[3]	ns	ns
	TM6MM	Y	ns	ns	ns	ns	Y[3]	ns	ns
ANKCONDENSE	ON	Y	ns	ns	ns	ns	Y[3]	ns	ns
	(OFF)	Y	ns	ns	ns	ns	Y[3]	ns	ns
FONT	(MSMINCHO)	Y	ns	ns	ns	ns	Y[3]	ns	ns
	MSGOTHIC	Y	ns	ns	ns	ns	Y[3]	ns	ns

[1] PERSONALITY is only a port-specific variable for the LaserJet 4PJ printer. For all other printers, it is a general variable. For all other printers, see the PERSONALITY variable in the tables on pages B-12, B-23, and B-35.

[2] DeskJet 1600C — these variables are only available using the DEFAULT and DINQUIRE commands.

[3] Only present when the optional ESC/P personality is installed.

Table A-3. PJL Environment Variables for HP LaserJet and DeskJet Printers									
Environment Variable	**Variable Values**	**4PJ 4LJ Pro**	**4 LC**	**5L 6L**	**5P 5MP**	**6P 6MP**	**5Si 5SiMx, Mopier**	**5 5M**	**1600C**
				PostScript-Specific Variables1					
ADOBEMBT	OFF	ns	ns	ns	Y	ns	ns	ns	ns
	ON	ns	ns	ns	Y	ns	ns	ns	ns
	(AUTO)	ns	ns	ns	Y	ns	ns	ns	ns
JAMRECOVERY	(OFF)	ns	ns	ns	Y	Y	Y	Y	ns
	ON	ns	ns	ns	Y	Y	Y	Y	ns
PRTPSERRS	(OFF)	ns	ns	ns	Y	Y	Y	Y	ns
	ON	ns	ns	ns	Y	Y	Y	Y	ns
RESOURCESAVE-SIZE [2]	0–max. available memory (100 Kb increments)	ns	ns	ns	Y	Y	Y	Y	ns

[1] Provided PostScript is installed. PostScript is an option in some printers.

[2] These variables can only be used with the DEFAULT, DINQUIRE, and INQUIRE commands. RESOURCESAVESIZE is a personality-specific variable.

Table A-4. PJL Environment Variables for HP LaserJet Printers								
Environment Variable	**Variable Values**	**1100 Series**	**2100 Series**	**4500 Series**	**5000 Series**	**8000 Series**	**8100 Series**	**8500 Series**
AUTOCONT[1]	OFF	(Y)[1]	(Y)[2]	Y	Y	Y	Y	RO
	ON	Y[1]	Y[2]	(Y)	(Y)	(Y)	(Y)	RO
AUTOSELECT	(ON)	ns	ns	ns	ns	ns	ns	ns
	OFF	ns	ns	ns	ns	ns	ns	ns
BINDING	(LONGEDGE)	ns	ns	Y	Y	ns	ns	Y
	SHORTEDGE	ns	ns	Y	Y	ns	ns	Y
BITSPERPIXEL	1 or (2) [or (8)[3]]	ns	ns	Y[3]	Y	Y	Y	ns
CLEARABLE-WARNINGS[1]	JOB	ns	ns	(Y)	(Y)	(Y)	(Y)	Y[1]
	ON	ns	ns	Y	Y	Y	Y	(Y)[1]
CONTEXT-SWITCH	(ON)	ns	ns	ns	ns	ns	ns	ns
	OFF	ns	ns	ns	ns	ns	ns	ns
COPIES	(1) to 999	Y	Y	Y	Y	Y	Y	Y
COURIER	(REGULAR)	ns	Y	Y	Y	Y	Y	Y
	DARK	ns	Y	Y	Y	Y	Y	Y
CPLOCK[2]	(OFF)	ns	ns	Y	Y	Y	Y	Y
	ON	ns	ns	Y	Y	Y	Y	Y
	MINIMUM	ns	ns	Y	Y	Y	Y	Y
	MODERATE	ns	ns	Y	Y	Y	Y	Y
	MAXIMUM	ns	ns	Y	Y	Y	Y	Y
DENSITY[1]	1 to 5 (3)	Y[1]	Y[2]	ns	Y[1]	Y[1]	Y[1]	Y[1]
DISKLOCK[2]	(OFF)	ns	ns	ns	Y	Y	Y	Y
	ON	ns	ns	ns	Y	Y	Y	Y
DUPLEX	(OFF)	ns	ns	Y	Y	Y	Y	Y
	ON	ns	ns	Y	Y	Y	Y	Y
ECONOMODE	(OFF)	Y	Y	ns	Y	Y	Y	ns
	ON	Y	Y	ns	Y	Y	Y	ns
FINISH[4]	(NONE)	ns	ns	ns	ns	Y	Y	ns
	STAPLE	ns	ns	ns	ns	Y	Y	ns
FORMLINES	5 to 128 (60)	Y	Y	Y	Y	Y	Y	Y

[1] When a SET or DEFAULT command is used with the AUTOCONT, CLEARABLEWARNINGS, or DENSITY variables, both the User Default and PJL Current Environment settings are modified (except for the LaserJet 4L, 5L, 6L, and 1100 Series printers). It is recommended these variables not be changed on a job-by-job basis.

[2] Only modifiable using the DEFAULT command.

[3] BITSPERPIXEL always snaps to 8 for the LaserJet 4500 printer.

[4] FINISH is only modifiable using the SET command.

Table A-4. PJL Environment Variables for HP LaserJet Printers								
Environment Variable	**Variable Values**	**1100 Series**	**2100 Series**	**4500 Series**	**5000 Series**	**8000 Series**	**8100 Series**	**8500 Series**
HOLD[1]	(OFF)	ns	ns	ns	ns	ns	Y	ns
	ON	ns	ns	ns	ns	ns	Y	ns
	PROOF	ns	ns	ns	ns	ns	Y	ns
	STORE	ns	ns	ns	ns	ns	Y	ns
	JOB	ns	ns	ns	ns	ns	ns	Y
HOLDKEY[1]	(""), 0000 to 9999	ns	ns	ns	ns	ns	Y	ns
HOLDTYPE[1]	(PUBLIC)	ns	ns	ns	ns	ns	Y	ns
	PRIVATE	ns	ns	ns	ns	ns	Y	ns
IMAGEADAPT	(AUTO)	Y	ns	ns	ns	ns	ns	ns
	OFF	Y	ns	ns	ns	ns	ns	ns
	ON	Y	ns	ns	ns	ns	ns	ns
INTRAY1	(UNLOCKED)	ns	Y	ns	ns	ns	ns	ns
	LOCKED	ns	Y	ns	ns	ns	ns	ns
INTRAY2	(UNLOCKED)	ns	Y	ns	ns	ns	ns	ns
	LOCKED	ns	Y	ns	ns	ns	ns	ns
INTRAY3	(UNLOCKED)	ns	Y	ns	ns	ns	ns	ns
	LOCKED	ns	Y	ns	ns	ns	ns	ns
INTRAY1SIZE	(LETTER)	ns	ns	RO	RO	RO	RO	RO
	LEGAL	ns	ns	RO	RO	RO	RO	RO
	A4	ns	ns	RO	RO	RO	RO	RO
	EXECUTIVE	ns	ns	RO	RO	RO	RO	RO
	LEDGER	ns	ns	ns	ns	RO	RO	RO
	A3, JISB4	ns	ns	ns	ns	RO	RO	RO
	JISB5	ns	ns	RO	RO	RO	RO	RO
	CUSTOM	ns	ns	RO	RO	RO	RO	RO
	COM10	ns	ns	RO	RO	RO	RO	RO
	MONARCH	ns	ns	RO	RO	RO	RO	RO
	C5, DL	ns	ns	RO	RO	RO	RO	RO
	B5	ns	ns	RO	RO	RO	RO	RO
	JPOST	ns	ns	ns	ns	ns	ns	RO
	JPOSTD	ns	ns	ns	ns	RO	RO	RO
	A5	ns	ns	RO	RO	RO	RO	RO
	ROC8K, ROC16K	ns	ns	ns	ns	ns	RO	RO
	JISEXEC	ns	ns	ns	ns	ns	RO	RO

[1] HOLD, HOLDKEY, and HOLDTYPE are only modifiable using the SET command.

Table A-4. PJL Environment Variables for HP LaserJet Printers								
Environment Variable	**Variable Values**	**1100 Series**	**2100 Series**	**4500 Series**	**5000 Series**	**8000 Series**	**8100 Series**	**8500 Series**
INTRAY2SIZE	(LETTER)	ns	ns	RO	RO	RO	RO	RO
	LEGAL	ns	ns	RO	RO	RO	RO	RO
	A4	ns	ns	RO	RO	RO	RO	RO
	EXECUTIVE	ns	ns	RO	RO	ns	ns	RO
	LEDGER	ns	ns	ns	ns	ns	ns	RO
	A3	ns	ns	ns	ns	ns	ns	RO
	JISB4	ns	ns	ns	ns	RO	RO	RO
	JISB5	ns	ns	RO	RO	ns	ns	RO
	CUSTOM	ns	ns	RO	RO	ns	ns	RO
	A5	ns	ns	RO	ns	ns	ns	RO
	COM10	ns	ns	RO	ns	ns	ns	RO
	UNKNOWNPAPER[1]	ns	ns	RO	ns	ns	ns	RO
INTRAY3SIZE	(LETTER)	ns	ns	RO	RO	RO	RO	RO
	LEGAL	ns	ns	RO	RO	RO	RO	RO
	A4	ns	ns	RO	RO	RO	RO	RO
	EXECUTIVE	ns	ns	RO	RO	ns	ns	RO
	COM10, DL	ns	ns	ns	ns	ns	ns	RO
	MONARCH	ns	ns	ns	ns	ns	ns	RO
	LEDGER	ns	ns	ns	ns	RO	RO	RO
	A3, JISB4	ns	ns	ns	ns	RO	RO	RO
	JISB5	ns	ns	RO	RO	ns	ns	RO
	CUSTOM	ns	ns	RO	RO	ns	ns	RO
	UNKNOWNPAPER[1]	ns	ns	RO	ns	ns	ns	RO
INTRAY4SIZE	(COM10)	ns	ns	ns	RO	RO	RO	RO
	MONARCH	ns	ns	ns	RO	RO	RO	RO
	C5, DL, B5	ns	ns	ns	RO	RO	RO	RO
	JPOSTD	ns	ns	ns	ns	RO	RO	RO
[1] This variable responds with UNKNOWNPAPER when the paper tray is pulled out.								

Table A-4. PJL Environment Variables for HP LaserJet Printers								
Environment Variable	**Variable Values**	**1100 Series**	**2100 Series**	**4500 Series**	**5000 Series**	**8000 Series**	**8100 Series**	**8500 Series**
INTRAY5SIZE	LETTER	ns	ns	ns	RO	RO	RO	ns
	LEGAL	ns	ns	ns	RO	RO	RO	ns
	A4	ns	ns	ns	RO	RO	RO	ns
	A3	ns	ns	ns	ns	RO	RO	ns
	LEDGER	ns	ns	ns	ns	RO	RO	ns
	JISB4	ns	ns	ns	ns	RO	RO	ns
	EXEC	ns	ns	ns	RO	ns	ns	ns
	JISB5	ns	ns	ns	RO	ns	ns	ns
	CUSTOM	ns	ns	ns	RO	ns	ns	ns
INTRAY6SIZE	*Tray-dependent*	ns	ns	ns	RO	RO	RO	ns
INTRAY7SIZE	*Tray-dependent*	ns	ns	ns	RO	RO	RO	ns
INTRAY8SIZE	*Tray-dependent*	ns	ns	ns	RO	RO	RO	ns
IOBUFFER[1]	ON	ns	Y	Y	Y	Y	Y	ns
	OFF	ns	Y	Y	Y	Y	Y	ns
	AUTO	ns	Y	(Y)	(Y)	Y	Y	ns
IOSIZE[1]	10 to max. available memory	ns	Y	Y	Y	Y	Y	ns
JOBATTR	*"attribute string"*	ns	ns	Y	Y	Y	Y	Y
JOBID	(OFF)	ns	ns	Y	Y	Y	Y	ns
	ON	ns	ns	Y	Y	Y	Y	ns
JOBIDVALUE	0 to 65535	ns	ns	ns	Y	Y	Y	ns
JOBNAME	"*jobname string*"	ns	ns	ns	ns	ns	Y	Y
JOBOFFSET	OFF	ns	ns	ns	(Y)	Y	Y	ns
	(ON)	ns	ns	ns	Y	Y	Y	ns

[1] The IOBUFFER and IOSIZE variables can only be used with the DEFAULT, DINQUIRE, and INQUIRE commands.

Table A-4. PJL Environment Variables for HP LaserJet Printers								
Environment Variable	**Variable Values**	**1100 Series**	**2100 Series**	**4500 Series**	**5000 Series**	**8000 Series**	**8100 Series**	**8500 Series**
LANG	DANISH	ns	Y	Y	Y	Y	Y	Y
	GERMAN	ns	Y	Y	Y	Y	Y	Y
	ENGLISH	ns	(Y)	(Y)	(Y)	(Y)	(Y)	(Y)
	SPANISH	ns	Y	Y	Y	Y	Y	Y
	FRENCH	ns	Y	Y	Y	Y	Y	Y
	ITALIAN	ns	Y	Y	Y	Y	Y	Y
	DUTCH	ns	Y	Y	Y	Y	Y	Y
	NORWEGIAN	ns	Y	Y	Y	Y	Y	Y
	POLISH	ns	Y	Y	Y	Y	Y	ns
	PORTUGUESE	ns	Y	Y	Y	Y	Y	Y
	FINNISH	ns	Y	Y	Y	Y	Y	Y
	SWEDISH	ns	Y	Y	Y	Y	Y	Y
	TURKISH	ns	Y	ns	Y	Y	Y	ns
	JAPANESE	ns	ns	Y	Y	Y	Y	ns
	CHINESE	ns	ns	ns	ns	ns	ns	ns
	CZECH	ns	ns	Y	Y	Y	Y	ns
	HUNGARIAN	ns	ns	ns	Y	Y	Y	ns
	RUSSIAN	ns	ns	Y	Y	Y	Y	ns
LOWTONER	(CONTINUE)	ns	ns	Y	Y	Y	Y	Y
	STOP	ns	ns	Y	Y	Y	Y	Y
MANUALFEED	(OFF)	Y	Y	ns	Y	Y	Y	Y
	ON	Y	Y	ns	Y	Y	Y	Y
MEDIASOURCE	TRAY1	ns	ns	ns	ns	ns	ns	ns
	TRAY2	ns	ns	ns	ns	ns	ns	ns
	TRAY3	ns	ns	ns	ns	ns	ns	ns

Table A-4. PJL Environment Variables for HP LaserJet Printers								
Environment Variable	**Variable Values**	**1100 Series**	**2100 Series**	**4500 Series**	**5000 Series**	**8000 Series**	**8100 Series**	**8500 Series**
MEDIATYPE	TRANSPARENCY	ns	ns	ns	ns	ns	ns	Y
	GLOSSY	ns	ns	ns	ns	ns	ns	Y
	PAPER	ns	ns	ns	ns	ns	ns	Y
	PREPRINTED	ns	ns	ns	ns	ns	ns	Y
	LETTERHEAD	ns	ns	ns	ns	ns	ns	Y
	PREPUNCHED	ns	ns	ns	ns	ns	ns	Y
	LABELS	ns	ns	ns	ns	ns	ns	Y
	BOND	ns	ns	ns	ns	ns	ns	Y
	RECYCLED	ns	ns	ns	ns	ns	ns	Y
	COLOR	ns	ns	ns	ns	ns	ns	Y
	CARDSTOCK	ns	ns	ns	ns	ns	ns	Y
	HEAVY	ns	ns	ns	ns	ns	ns	Y
	TYPE28161	ns	ns	ns	ns	ns	ns	Y
	TYPE28162	ns	ns	ns	ns	ns	ns	Y
	ENVELOPE	ns	ns	ns	ns	ns	ns	Y
MPTRAY	MANUAL	ns	ns	ns	ns	ns	ns	ns
	CASSETTE	ns	Y	Y[1]	Y[1]	Y	Y	Y
	FIRST	ns	(Y)	(Y)[1]	(Y)[1]	(Y)	(Y)	Y
ORIENTATION	(PORTRAIT)	Y	Y	Y	Y	Y	Y	Y
	LANDSCAPE	Y	Y	Y	Y	Y	Y	Y
OUTBIN	(UPPER)	ns	ns	RO	Y	Y	Y	Y
	LOWER	ns	ns	ns	ns	Y	Y	Y
	OPTIONAL OUTPUTBIN1...16	ns	ns	ns	ns	Y	Y	Y (1.. 9)
OUTBINPROCESS	0 to 255	ns	ns	ns	ns	Y	Y	ns
OUTLINEPOINTSIZE	0 to 999 (72)	ns	ns	Y	Y	Y	Y	ns
OUTTONER	(STOP)	ns	ns	Y	ns	ns	ns	ns
	CONTINUE	ns	ns	Y	ns	ns	ns	ns
PAGEPROTECT	OFF	Y	ns	ns	ns	ns	ns	ns
	ON	Y	Y	ns	Y	Y	Y	ns
	AUTO	(Y)	(Y)	ns	(Y)	(Y)	(Y)	ns

[1] For LaserJet 5000 and Color LaserJet 4500 series printers, the MPTRAY variable can only be changed using the PJL DEFAULT command.

Table A-4. PJL Environment Variables for HP LaserJet Printers

Environment Variable	Variable Values	1100 Series	2100 Series	4500 Series	5000 Series	8000 Series	8100 Series	8500 Series
PAPER	LETTER[3]	(Y)	(Y)	(Y)	(Y)	(Y)	(Y)	(Y)
(Letter, Legal, Ledger, A3, A4, Executive, JISB4, and JISB5 are paper sizes; Com10, C5, DL, Monarch, and B5 are envelope sizes; JPOST and JPOSTD are Japanese post card sizes; CUSTOM is for feeding other sizes, such as 3 x 5 cards and labels)	LEGAL	Y	Y	Y	Y	Y	Y	Y
	A4[3]	Y	Y	Y	Y	Y	Y	Y
	LEDGER	ns	ns	ns	ns	Y	Y	Y
	A3, JISB4	ns	ns	ns	ns	Y	Y	Y
	JISB5	ns	Y	Y	Y	Y	Y	Y
	EXECUTIVE	Y	Y	Y	Y	Y	Y	Y
	COM10[3]	Y	Y	Y	Y	Y	Y	Y
	MONARCH	Y	Y	Y	Y	Y	Y	Y
	DL[3]	Y	Y	Y	Y	Y	Y	Y
	C5	Y	Y	Y	Y	Y	Y	Y
	B5	Y	Y	Y	Y	Y	Y	Y
	CUSTOM	ns	Y	Y	Y	Y	Y	Y
	JPOST	ns	Y	ns	ns	ns	ns	ns
	JPOSTD	ns	Y	ns	ns	Y	Y	Y
	A5	ns	Y	Y	Y	Y	Y	Y
	ROC8K, ROC16K	ns	ns	ns	ns	ns	Y	ns
	JISEXEC	ns	ns	ns	ns	ns	Y	ns
PARALLEL	SLOW	ns	ns	ns	ns	ns	ns	ns
	FAST	ns	ns	ns	ns	ns	ns	ns
PASSWORD[1]	(0) to 65535	ns	Y	Y	Y	Y	Y	Y
PERSONALITY[2]	AUTO	ns	(Y)	(Y)	(Y)	(Y)	(Y)	(Y)
	PCL	(Y)	Y	Y	Y	Y	Y	Y
	POSTSCRIPT	ns	Y	Y	Y	Y	Y	Y
PLANESINUSE	1 or (3)[4]	ns	ns	Y	ns	ns	ns	ns
POWERSAVE	ON	ns	ns	(Y)	(Y)	(Y)	(Y)	Y
	OFF	ns	ns	Y	Y	Y	Y	Y

[1] The PASSWORD variable is only supported with the DEFAULT, DINQUIRE, and INQUIRE commands.

[2] For the LaserJet 4PJ printer, PERSONALITY is a port-specific variable. For all other LaserJet printers, personality is not I/O port-specific. Available only if the optional ESC/P personality is installed.

[3] If configured for metric paper sizes, A4 is the default paper size and DL is the default envelope size.

[4] Monochrome = 1, color = 3

Table A-4. PJL Environment Variables for HP LaserJet Printers								
Environment Variable	**Variable Values**	**1100 Series**	**2100 Series**	**4500 Series**	**5000 Series**	**8000 Series**	**8100 Series**	**8500 Series**
POWERSAVETIME	1	ns	ns	Y	ns	ns	ns	ns
	15	ns	ns	ns	Y	Y	Y	ns
	30	ns	ns	Y	(Y)	Y	Y	Y
	60	ns	ns	(Y)	Y	(Y)	(Y)	Y
	120	ns	ns	Y	Y	Y	Y	ns
	180	ns	ns	ns	Y	Y	Y	Y
	240	ns	ns	Y	ns	ns	ns	ns
	480	ns	ns	Y	ns	ns	ns	Y
PRINTQUALITY	DRAFT	ns	ns	ns	ns	ns	ns	ns
	NORMAL	ns	ns	ns	ns	ns	ns	ns
	HIGH	ns	ns	ns	ns	ns	ns	ns
QTY	(1) to 999	ns	ns	ns	Y	Y	Y	Y
RENDERMODE	COLOR	ns	ns	ns	ns	ns	ns	Y
	GRAYSCALE	ns	ns	ns	ns	ns	ns	Y
REPRINT	(AUTO)	ns	Y	ns	Y	Y	Y	ns
	ON	ns	Y	Y	Y	Y	Y	ns
	OFF	ns	Y	(Y)	Y	Y	Y	ns
RESOLUTION	300	Y	Y	ns	Y	Y	Y	ns
	600	(Y)	Y	(Y)	(Y)	(Y)	(Y)	(Y)
	1200	ns	(Y)	ns	Y	ns	ns	ns
RESOURCESAVE[1]	ON	ns	Y	ns	Y	Y	Y	ns
	OFF	ns	Y	ns	(Y)	(Y)	(Y)	ns
	AUTO	ns	(Y)	ns	Y	Y	Y	ns
RET	OFF	Y	Y	ns	Y	Y	Y	ns
	LIGHT	n	Y	ns	Y	Y	Y	ns
	MEDIUM	n	(Y)	ns	(Y)	(Y)	(Y)	ns
	DARK	n	Y	ns	Y	Y	Y	ns
	ON	(Y)	ns	ns	ns	ns	ns	ns
TIMEOUT	5 to 300 (15)	ns	Y	Y	Y	Y	Y	Y

[1] These variables can only be used with the DEFAULT, DINQUIRE, and INQUIRE commands. RESOURCESAVESIZE is a personality-specific variable.

Table A-4. PJL Environment Variables for HP LaserJet Printers								
Environment Variable	**Variable Values**	**1100 Series**	**2100 Series**	**4500 Series**	**5000 Series**	**8000 Series**	**8100 Series**	**8500 Series**
USERNAME	"*username string*"	ns	ns	ns	ns	ns	Y	Y
WIDEA4	(NO)	ns	Y	ns	Y	Y	Y	Y
	YES	ns	Y	ns	Y	Y	Y	Y
PCL-Specific Variables								
FONTNUMBER	(0) to n (maximum value depends on the currently set font source)	Y	Y	Y	Y	Y	Y	Y
FONTSOURCE	(I)	Y	Y	(Y)	Y	Y	Y	Y
	M1,M2,M3 . . Mn	ns	Y	Y	Y	Y	Y	Y
	C	ns	ns	ns	ns	ns	ns	ns
	C1	ns	ns	ns	ns	ns	ns	ns
	C2	ns	ns	ns	ns	ns	ns	ns
	S	Y	Y	Y	Y	Y	Y	Y
LINETERMINATION	(0), 1, 2, 3	ns	Y	ns	ns	ns	ns	ns
PITCH	0.44 to 99.99 (10.00)	Y	Y	Y	Y	Y	Y	Y
PTSIZE	4.00 to 999.75 (12.00)	Y	Y	Y	Y	Y	Y	Y
RESOURCE-SAVESIZE[1]	0 to max. available memory (in 100 Kb increments)	ns	Y	ns	Y	Y	Y	ns
[1] These variables can only be used with the DEFAULT, DINQUIRE, and INQUIRE commands. RESOURCESAVESIZE is a personality-specific variable.								

Table A-4. PJL Environment Variables for HP LaserJet Printers								
Environment Variable	**Variable Values**	**1100 Series**	**2100 Series**	**4500 Series**	**5000 Series**	**8000 Series**	**8100 Series**	**8500 Series**
SYMSET (continued on the following pages)	DESKTOP	Y	Y	Y	Y	Y	Y	Y
	ISO4	Y	Y	Y	Y	Y	Y	Y
	ISO6	Y	Y	Y	Y	Y	Y	Y
	ISO11	Y	Y	Y	Y	Y	Y	Y
	ISO15	Y	Y	Y	Y	Y	Y	Y
	ISO17	Y	Y	Y	Y	Y	Y	Y
	ISO21	Y	Y	Y	Y	Y	Y	Y
	ISO60	Y	Y	Y	Y	Y	Y	Y
	ISO69	Y	Y	Y	Y	Y	Y	Y
	ISOL1	Y	Y	Y	Y	Y	Y	Y
	ISOL2	Y	Y	Y	Y	Y	Y	Y
	ISOL5	Y	Y	Y	Y	Y	Y	Y
	ISOL6	ns	Y	Y	Y	Y	Y	Y
	LEGAL	Y	Y	Y	Y	Y	Y	Y
	MATH8	Y	ns	ns	ns	ns	ns	ns
	MCTEXT	Y	Y	Y	Y	Y	Y	Y
	MSPUBL	Y	ns	ns	ns	ns	ns	ns
	PC775	ns	Y	Y	Y	Y	Y	Y
	PC8	(Y)	(Y)	(Y)	(Y)	(Y)	(Y)	(Y)
	PC850	Y	Y	Y	Y	Y	Y	Y
	PC852	Y	Y	Y	Y	Y	Y	Y
	PC8DN	Y	Y	Y	Y	Y	Y	Y
	PC8TK	Y	Y	Y	Y	Y	Y	Y
	PC1004	ns	Y	Y	Y	Y	Y	Y
	PIFONT	Y	ns	ns	ns	ns	ns	ns
	PSMATH	Y	ns	ns	ns	ns	ns	ns
	PSTEXT	Y	Y	Y	Y	Y	Y	Y
	ROMAN8	Y	Y	Y	Y	Y	Y	Y
	VNINTL	Y	ns	ns	ns	ns	ns	ns
	VNMATH	Y	ns	ns	ns	ns	ns	ns
	VNUS	Y	ns	ns	ns	ns	ns	ns
	WIN30	Y	Y	Y	Y	Y	Y	Y
	WINBALT	ns	Y	Y	Y	Y	Y	Y
	WINL1	Y	Y	Y	Y	Y	Y	Y
	WINL2	Y	Y	Y	Y	Y	Y	Y

Table A-4. PJL Environment Variables for HP LaserJet Printers								
Environment Variable	**Variable Values**	**1100 Series**	**2100 Series**	**4500 Series**	**5000 Series**	**8000 Series**	**8100 Series**	**8500 Series**
SYMSET continued	WINL5	Y	Y	Y	Y	Y	Y	Y
	WIN31J	ns	ns	ns	Y	Y	Y	ns
Port-Specific Variables								
PERSONALITY[2]	ESCP	ns	ns	ns	ns	ns	ns	ns
	PCL	ns	ns	ns	ns	ns	ns	ns
ESC/P-Specific Variables[1]								
CARRIAGE-RETURN	(CR)	ns	ns	ns	ns	ns	ns	ns
	CRLF	ns	ns	ns	ns	ns	ns	ns
CHARACTER-SET	(KANA)	ns	ns	ns	ns	ns	ns	ns
	EG	ns	ns	ns	ns	ns	ns	ns
TOPMARGIN	(TM19MM)	ns	ns	ns	ns	ns	ns	ns
	TM6MM	ns	ns	ns	ns	ns	ns	ns
ANKCONDENSE	ON	ns	ns	ns	ns	ns	ns	ns
	(OFF)	ns	ns	ns	ns	ns	ns	ns
FONT	(MSMINCHO)	ns	ns	ns	ns	ns	ns	ns
	MSGOTHIC	ns	ns	ns	ns	ns	ns	ns
[1] Only present when the optional ESC/P personality is installed [2] PERSONALITY is only a port-specific variable for the LaserJet 4PJ printer. For all other printers, it is a general variable. For all other printers, see the PERSONALITY variable in the tables on pages B-12, B-23, and B-35.								
PostScript-Specific Variables[1]								
ADOBEMBT	OFF	ns	ns	ns	ns	ns	ns	ns
	ON	ns	ns	ns	ns	ns	ns	ns
	(AUTO)	ns	ns	ns	ns	ns	ns	ns
JAMRECOVERY	(OFF)	ns	Y	ns	ns	ns	ns	Y
	ON	ns	Y	ns	ns	ns	ns	Y
PRTPSERRS	(OFF)	ns	Y	Y	Y	Y	Y	Y
	ON	ns	Y	Y	Y	Y	Y	Y
RESOURCE-SAVESIZE[2]	0 to max. available memory (in 100 Kb increments)	ns	Y	ns	Y	Y	Y	ns
[1] Provided PostScript is installed. PostScript is an option in some printers. [2] These variables can only be used with the DEFAULT, DINQUIRE, and INQUIRE commands. RESOURCESAVESIZE is a personality-specific variable.								

Table A-5. PJL Environment Variables for HP DesignJets									
Environment Variable[1]	**Variable Values**	**230**	**250C**	**330**	**350C**	**430**	**450C**	**455CA**	**488CA**
COMPRESSRAST.	(all values)	ns	ns	ns	ns	ns	ns	ns	ns
IMAGELOCATION	(all values)	ns	ns	ns	ns	ns	ns	ns	ns
MARGINS	NORMAL	ns	ns	ns	ns	ns	ns	ns	ns
	SMALLER	ns	ns	ns	ns	ns	ns	ns	ns
	EXTENDED	ns	ns	ns	ns	ns	ns	ns	ns
MEDIASOURCE	(all values)	ns	ns	ns	ns	ns	ns	ns	ns
MIRROR	ON, (OFF)	Y	Y	Y	Y	Y	Y	Y	Y
ORIENTATION	(PORTRAIT)	Y	Y	Y	Y	Y	Y	Y	Y
	LANDSCAPE	Y	Y	Y	Y	Y	Y	Y	Y
PAGELENGTH-ACCURACY	(all values)	ns	ns	ns	ns	ns	ns	ns	ns
PALETTESOURCE	(DEVICE)	Y	Y	Y	Y	Y	Y	Y	Y
	SOFTWARE	Y	Y	Y	Y	Y	Y	Y	Y
PAPERLENGTH	0 to 432000	Y	Y	Y	Y	Y	Y	Y	Y
PAPERWIDTH	0 to 432000	Y	Y	Y	Y	Y	Y	Y	Y
PRINTAREA	(FULLSIZE)	ns	ns	ns	ns	Y	Y	Y	Y
	INKEDAREA	ns	ns	ns	ns	Y	Y	Y	Y
REFILLDURAT'N	(all values)	ns	ns	ns	ns	ns	ns	ns	ns
REFILLTHRESH.	(all values)	ns	ns	ns	ns	ns	ns	ns	ns
REFILLTYPE	(all values)	ns	ns	ns	ns	ns	ns	ns	ns
RENDERMODE	(COLOR)	ns	Y	ns	Y	ns	Y	Y	Y
	GRAYSCALE	ns	Y	ns	Y	ns	Y	Y	Y
RESOLUTION	(300)	Y	Y	Y	Y	Y	Y	Y	Y
	600	ns	ns	ns	ns	ns	ns	ns	ns
RET	ON	ns	ns	(Y)	(Y)	(Y)	(Y)	(Y)	(Y)
	OFF	ns	ns	Y	Y	Y	Y	Y	Y
	AUTO	ns	ns	ns	ns	ns	ns	ns	ns

[1] The HP DesignJet 200, 220, 600, and 650C do not support any environment variables.

Table A-5. PJL Environment Variables for HP DesignJets							
Environment Variable[1]	**Variable Values**	**700**	**750C**	**750C Plus**	**755CM**	**1050C**	**1055CM**
COMPRESSRAST.	(all values)	ns	ns	ns	ns	Y	Y
IMAGELOCATION	(all values)	ns	ns	ns	ns	Y	Y
MARGINS	NORMAL	(Y)	(Y)	(Y)	(Y)	(Y)	(Y)
	SMALLER	Y	Y	Y	Y	ns	ns
	EXTENDED	ns	ns	ns	ns	Y	Y
MEDIASOURCE	(all values)	ns	ns	ns	ns	Y	Y
MIRROR	ON, (OFF)	Y	Y	Y	Y	Y	Y
ORIENTATION	(PORTRAIT)	Y	Y	Y	Y	Y	Y
	LANDSCAPE	Y	Y	Y	Y	Y	Y
PAGELENGTH-ACCURACY	EXACT	ns	ns	ns	ns	ns	ns
	OPTIMIZED	ns	ns	ns	ns	Y	Y
	CONSTANT	ns	ns	ns	ns	ns	ns
	MAXIMUM	ns	ns	ns	ns	Y	Y
PALETTESOURCE	(DEVICE)	Y	Y	Y	Y	Y	Y
	SOFTWARE	Y	Y	Y	Y	Y	Y
PAPERLENGTH	0 to 432000	Y	Y	Y	Y	Y	Y
PAPERWIDTH	0 to 432000	Y	Y	Y	Y	Y	Y
PRINTAREA	(FULLSIZE)	Y	ns	Y	Y[2]	Y	Y
	INKEDAREA	Y	ns	Y	Y[2]	Y	Y
REFILLDURAT'N	(all variables)	ns	ns	ns	ns	ns	ns
REFILLTHRESH.	(all variables)	ns	ns	ns	ns	ns	ns
REFILLTYPE	(all variables)	ns	ns	ns	ns	ns	ns
RENDERMODE	(COLOR)	ns	Y	Y	Y	Y	Y
	GRAYSCALE	ns	Y	Y	Y	Y	Y
RESOLUTION	(300), 600	Y	Y	Y	Y	Y	Y
RET	ON	ns	ns	Y	(Y[2])	(Y)	(Y)
	OFF	ns	ns	Y	Y[2]	Y	Y
	AUTO	ns	ns	(Y)	Y[2]	Y	Y

[1] The HP DesignJet 200, 220, 600, and 650C do not support any environment variables.
[2] Supported on the model C3198B only.

Table A-5. PJL Environment Variables for HP DesignJets					
Environment Variable	**Variable Values**	**2000CP**	**2500CP**	**3000CP**	**3500CP**
COMPRESSRASTER-STORAGE	(ON)	ns	ns	ns	ns
	OFF	ns	ns	ns	ns
IMAGELOCATION	(DISK), RAM	ns	ns	ns	ns
MARGINS	NORMAL	Y	Y	Y	Y
	SMALLER	Y	Y	Y	Y
	EXTENDED	(Y)	(Y)	(Y)	(Y)
MEDIASOURCE	MANUALFEED	ns	ns	ns	ns
	ROLL1	ns	ns	ns	ns
MIRROR	ON, (OFF)	Y	Y	Y	Y
ORIENTATION	(PORTRAIT)	Y	Y	Y	Y
	LANDSCAPE	Y	Y	Y	Y
PAGELENGTH-ACCURACY	EXACT	Y	Y	Y	Y
	OPTIMIZED	Y	Y	Y	Y
	CONSTANT	Y	Y	Y	Y
	MAXIMUM	ns	ns	ns	ns
PALETTESOURCE	(DEVICE), SOFTWARE	Y	Y	Y	Y
PAPERLENGTH	0 to 432000	Y	Y	Y	Y
PAPERWIDTH	0 to 432000	Y	Y	Y	Y
PRINTAREA	(FULLSIZE)	Y	Y	Y	Y
	INKEDAREA	Y	Y	Y	Y
REFILLDURATION	NORMAL, QUICK	ns	ns	Y	Y
REFILLTHRESHOLD	5 to 100	ns	ns	Y	Y
REFILLTYPE	INTERLEAVED	ns	ns	Y	Y
	SHARP	ns	ns	Y	Y
RENDERMODE	(COLOR)	Y	Y	Y	Y
	GRAYSCALE	Y	Y	Y	Y
RESOLUTION	(300)	Y	Y	Y	Y
	600	Y	Y	Y	Y
RET	ON	ns	ns	ns	ns
	OFF	ns	ns	ns	ns
	AUTO	ns	ns	ns	ns

HP LaserJet IIISi Comments

The LaserJet IIISi printer implements the three PJL kernel commands: ENTER, COMMENT, and the UEL command.

As with other PJL printers, the HP LaserJet IIISi printer performs explicit printer language switching using the ENTER command. To enable the printer for language switching, the SYS SWITCH control panel setting must be set to ON. To select a default printer language for implicit switching, set SYS = to the desired language (PCL or PostScript) from the control panel. The LaserJet IIISi printer does not perform context switching.

The HP LaserJet IIISi printer does not support any PJL status readback commands, environment variable commands, or device attendance commands.

For an example that uses the PJL features found in the HP LaserJet IIISi printer, see the “Using the ENTER Command” example in Chapter 4.

Comments about HP LaserJet Printers

This section explains some important points that should be considered when using PJL with HP LaserJet 4, LaserJet 5, and Color LaserJet printer families, and the HP LaserJet 6P/6MP printers. Support for the features described in this section varies. HP LaserJet family printers that support a particular feature are listed at the beginning of each feature description.

Printer Language Switching

Printers supporting printer language switching:
HP LaserJet 4, 4M, 4 Plus, 4M Plus, 4V, 4MV, 4Si, 4SiMx, 4ML, 4P, 4MP, 4PJ, 4LJ Pro, 4000 series, 5, 5M, 5P, 5MP, 6P, 6MP, 5Si, 5SiMx, 5Si Mopier, HP Color LaserJet, HP Color LaserJet 5, 5M, 2100 series, 4500 series, 5000 series, 8000 series, 8100 series, 8500 series

Printers that perform context switching automatically switch printer languages when both of the following conditions are met:

- The PERSONALITY variable is set to AUTO.
- The print job contains printable data but does not contain an ENTER command immediately before the printable data.

Note HP LaserJet 4PJ and 4LJ Pro printers perform implicit language switching, but not context switching.

HP LaserJet 4V and 4MV printers cannot context-switch into the ESC/P language—use explicit switching instead.

Under these conditions, the printer samples the incoming printable data and looks for indications of a particular printing language. Once it recognizes the printer language, the printer backs up to the beginning of the sampled print data and switches to the printer language determined to be most appropriate. Then the printer begins to parse the data in the newly selected printer language.

Although the printer can accurately select printer languages this way, we recommend that every job containing printable data include an ENTER LANGUAGE command to explicitly switch to the correct printer language. This method improves performance and eliminates errors in printer language switching. It also guarantees that the correct language is always selected.

Printer Status Readback

Printers supporting printer status readback:
HP LaserJet 4, 4M, 4 Plus, 4M Plus, 4V, 4MV, 4Si, 4SiMx, 4L, 4ML, 4P, 4MP, 4PJ, 4LJ Pro, 4LC, 4000 series, 5, 5M, 5L, 5P, 5MP, 6L, 6P, 6MP, 5Si, 5SiMx, 5Si Mopier, HP Color LaserJet, HP Color LaserJet 5, 5M, 1100 series, 2100 series, 4500 series, 5000 series, 8000 series, 8100 series, 8500 series

When requesting status information from the printer, ignore all status information that you did not request. For example, if you request INFO ID and get USTATUS or some other response, ignore that response and read the next one until you receive the INFO ID response.

Due to other printer users in a multi-user system, there may be situations where the printer status buffer overflows, and instead of receiving requested status information, you receive the 10010 error. (For the HP LaserJet 4 and 5 family printers except for the LaserJet 4PJ, the 30010 error is returned for “buffer overflow” instead of the normal 10010 error code. HP LaserJet 4PJ and 4LJ Pro printers return the 10010 error code.) Reading the 10010 or 30010 error clears the status buffer; if you receive either error, resend the status request.

Commands That Affect Printer Memory

Printers that reconfigure memory due to PJL commands:
HP LaserJet 4, 4M, 4 Plus, 4M Plus, 4V, 4MV, 4Si, 4SiMx, 4ML, 4P, 4MP, 4PJ, 4LJ Pro, 4LC, 4000 series, 5, 5M, 5P, 5MP, 6L, 6P, 6MP, 5Si, 5SiMx, 5Si Mopier, HP Color LaserJet, HP Color LaserJet 5, 5M, LaserJet 1100 series, 2100 series, 4500 series, 5000 series, 8000 series, 8100 series, 8500 series

Four conditions may cause the printer to reconfigure user memory:

- When the printer language changes, either implicitly or explicitly by using the ENTER LANGUAGE command (except when resource saving is enabled).
- When the page protection setting changes, using the SET or DEFAULT commands, or when the printer is reset using the RESET or INITIALIZE commands or by using the control panel.
- When the resolution is changed using either the SET or DEFAULT commands, or by using the control panel.
- When changing the I/O buffering or resource saving settings.

Reconfiguring printer memory erases all volatile personality-specific resource information, including downloaded fonts, PCL macros, and PostScript dictionaries (however no I/O data is lost). Memory can be reconfigured only when these conditions actually change the page protection, resolution, or printer language status. For example, if the resolution is at 600 dpi and an application sends the @PJL SET RESOLUTION = 600 command, memory is not reconfigured.

If *resource saving* is enabled, memory is reconfigured, but all volatile personality-specific resource information (such as fonts, macros, and PostScript dictionaries) are not lost (see “Resource Saving” below). If resource saving is disabled, these resources are erased.

Resource Saving

Printers that support resource saving:
HP LaserJet 4 Plus, 4M Plus, 4V, 4MV, 4Si, 4SiMx, 4000 series, 5, 5M, 5P, 5MP, 6P, 6MP, 5Si, 5SiMx, 5Si Mopier, 2100 series, 5000 series, 8000 series, 8100 series

Resource saving is a feature that allows you to prevent loss of permanent resources (such as fonts, macros, and PostScript dictionaries) when the printer language, page protection, or resolution status changes. You can use either PJL or the control panel to configure resource saving on HP LaserJet 4 Plus, 4M Plus, 4V, and 4MV printers. For
HP LaserJet 4Si/4SiMx and 5Si/5SiMx printers, resource saving is only configurable from the control panel.

Printer-Specific Job Boundaries

Printers that support PJL job boundaries:
HP LaserJet 4, 4M, 4 Plus, 4M Plus, 4V, 4MV, 4Si, 4SiMx, 4ML, 4P, 4MP, 4PJ, 4LJ Pro, 4LC, 4000 series, 5, 5M, 5P, 5MP, 6P, 6MP, 5Si, 5SiMx, 5Si Mopier, HP Color LaserJet, HP Color LaserJet 5, 5M, 4500 series, 8500 series, LaserJet 2100 series, 5000 series, 8000 series, 8100 series

The printers listed above handle the following conditions as PJL job boundaries. When any of these conditions occur, the User Default Environment values are loaded into the PJL Current Environment, which then are loaded into the Modified Print Environment.

- Control panel reset
- Printer language-specific exit command, such as ^D for PostScript. (Printer language-specific exit commands are not job boundaries when within a PJL JOB/EOJ command pair.)
- Data stream idle timeout (this occurs when a PJL job is in progress and there is no data received over the I/O for a specified length of time). To avoid a timeout, use the PJL JOB or ENTER commands, since using the JOB or ENTER commands increases the time the printer waits for I/O data. This increase is because the printer is processing a job with clearly indicated start-of-job and end-of-job data stream commands. See the following “Timeouts” section.

- Using the control panel to perform a self test, or to print a typeface list or demo page.
- A job boundary indicated by the I/O card, such as the AppleTalk end-of-file.

Timeouts

Printers that support the TIMEOUT variable:
HP LaserJet 4, 4M, 4 Plus, 4M Plus, 4V, 4MV, 4Si, 4SiMx, 4ML, 4P, 4MP, 4PJ, 4LJ Pro, 4LC, 4000 series, 5, 5M, 5P, 5MP, 6P, 6MP, 5Si, 5SiMx, 5Si Mopier, 2100 series, 4500 series, 5000 series, 8000 series, 8100 series, 8500 series

These printers have a timeout capability which is used to recover when jobs are interrupted by situations such as power failures. The timeout duration varies depending on the data received by the printer.

The TIMEOUT variable set using PJL or the control panel establishes the job timeout duration for those jobs that do not contain JOB or ENTER commands. For jobs that do contain the JOB or ENTER commands, the printer uses an extended timeout duration, which is equal to five minutes or ten times the TIMEOUT value, whichever is greatest.

Backward-Compatibility Mode

Printers that support the backward-compatibility mode:
HP LaserJet 4, 4M, 4 Plus, 4M Plus, 4V, 4MV, 4Si, 4SiMx, 4L, 4ML, 4P, 4MP, 4PJ, 4LJ Pro, 4LC, 4000 series, 5, 5M, 5L, 5P, 5MP, 6L, 6P, 6MP, 5Si, 5SiMx, 5Si Mopier, HP Color LaserJet, HP Color LaserJet 5, 5M, 1100 series, 2100 series, 4500 series, 5000 series, 8000 series, 8100 series, 8500 series

If the printer detects PCL data immediately after a job boundary, it enters a backward-compatibility mode that responds like an HP LaserJet III printer. This lasts until the next job boundary is detected. For backward- compatibility mode to occur, the PERSONALITY variable must be set to AUTO or PCL, and the job must contain only PCL data—if any PJL commands are received during the job, the printer does not enter backward-compatibility mode.

There are two differences between backward-compatibility mode and normal operating mode. In backward-compatibility mode, when a PCL printer language reset (<ESC>E) is executed, instead of causing the PJL Current Environment variables to be loaded into the Modified Print Environment, the User Default Environment settings (control panel values) are loaded. This is the same way the LaserJet III printer works.

Note Because HP LaserJet 4L, 5L, 6L, and 1100 series printers do not support job boundaries (JOB/EOJ), they always load the PJL Current Environment variables into the Modified Print Environment after receiving an <ESC>E reset.

Also, when a backward-compatible job ends with a partial page (one not terminated with a form feed or PCL printer language reset) and the job times out, the job does not immediately end, printing the partial page. Instead, the printer waits to see if the next job sent consists of more PCL data (from the same I/O port), which it then appends to the partial page already in the printer. (This works the same way as the HP LaserJet III printer, which does not have a job timeout.) If PJL data is received instead, the partial page is printed before the new PJL job is executed.

PJL Job Security

Printers that support PJL job security:
HP LaserJet 4/4M Plus, 4V, 4MV, 4Si, 4SiMx, 4000 series, 5, 5M, 5Si, 5SiMx, 5Si Mopier, 2100 series, 4500 series, 5000 series, 8000 series, 8100 series, 8500 series (5P, 5MP, 6P, 6MP, 2100: password only),

The printers listed above provide two PJL security features: password protection and control panel lockout. HP LaserJet 4V/4MV and 5Si/5SiMx printers also provide disk lock protection. As discussed in Chapter 5, the DEFAULT command can be used to set a PJL password. Once the password is set, all succeeding jobs must issue the correct password in order to enable the DEFAULT and INITIALIZE commands. The password can only be changed from within a secure PJL job.

On printers with a control panel, the control panel can be “locked out” so that users cannot modify settings using the control panel keys. This is accomplished using the DEFAULT command to set the CPLOCK variable to ON.

The LaserJet 4V/4MV and 5Si/5SiMx printer's disk can be “locked” so that it cannot be formatted, fonts cannot be written to it, and disk fonts cannot be erased. For more information on CPLOCK, DISKLOCK and other security issues, see “PJL Job Security” in Chapter 5.

LaserJet Printers with Reduced-Function Control Panels

HP LaserJet 4L, 4LJ Pro, 4ML, 4LC, 5P, 6P, 6MP, 5L, 6L and 1100 series printers have no control panel to specify printer settings. These printers have several features that are different than those of other PJL printers. This section describes those differences and how they affect the use of PJL.

- No device attendance commands are supported—these printers rely on unsolicited status to inform the user.
- No NVRAM (HP LaserJet 4L/5L/6L only)—because these printers are designed to conserve energy and do not have a power switch, they are never turned off. Therefore, they do not need NVRAM to store feature settings. To simulate a power cycle, use the RESET command to initialize all PJL variables except PAPERSIZE.
- For the LaserJet 1100 series printers, the RESET command does not initialize the PAGECOUNT, SYMSET, and PAPER variables. Instead, it sets the current value equal to the stored default value.
- For the LaserJet 1100 series printers, the INITIALIZE command does not reset the PJL variables stored in NVRAM back to the factory values. It sets their current values to the stored default values.
- No multiple I/Os or job boundaries supported (LaserJet 4L/5L/6L/1100 series only)—these printers are designed for single-user environments. They do not support I/O switching or the concept of job boundaries. Therefore, the JOB and EOJ commands are not supported.
- No multiple language support (LaserJet 4L/5L/6L only)—there is no support for multiple printer languages. PCL 5 is the sole printer language. Even though there is only one language, use the PJL ENTER LANGUAGE command to specify PCL.
- EconoMode—a toner-saving feature that produces draft-like pages when top-quality printing is not necessary.

Color LaserJet Printer Comments

The Color LaserJet printer supports context-sensitive language switching, true end-of-job notification, job boundary recognition, and automatic I/O switching. See the PJL Feature Support table in the beginning of this chapter for a list of the PJL features supported. Note that the SET and INQUIRE commands are limited to only being used with the RET variable.

HP DeskJet 1200C and 1600C Printer Family Comments

This sections explains some important points that should be considered when using PJL with the DeskJet 1200C and 1600C family printers. Support for the features described in this section varies. The HP DeskJet 1200C and 1600C family printers that support a particular feature are listed at the beginning of each feature description.

Printer Language Switching

Printers that support printer language switching:
HP DeskJet 1200C, 1200CM, 1600C, 1600CM

Printers that perform context switching automatically switch printer languages when both of the following conditions are met:

- For the DeskJet 1200C and 1200CM: when the rear panel DIP switch is set in the “Context On” position.
- For the DeskJet 1600C and 1600CM: when the PJL “CONTEXTSWITCH” environment variable is set to ON.
- The print job contains printable data but does not contain a PJL ENTER LANGUAGE command immediately before the printable data.

Under these conditions, the printer samples the incoming printable data and looks for indications of a particular printer language. Once it recognizes the printer language, the printer backs up to the beginning of the sampled print data and switches to the printer language determined to be most appropriate. Then the printer begins to parse the data in the newly selected printer language.

Although the printer can accurately select printer languages this way, we recommend that every job containing printable data include an ENTER LANGUAGE command to explicitly switch to the correct printer language. This method improves performance and eliminates errors in printer language switching. It also guarantees that the correct language is always selected.

Note The value of the PARALLEL feature as shipped from the factory is FAST. When a front panel reset is performed, the value is defaulted to SLOW.

Printer Environment

Printers that support printer environment variables:
HP DeskJet 1600C, 1600M

Unlike most PJL variables, the following environment variable defaults are not stored in the printer's NVRAM. The primary use is to set job-specific parameters like those available through the DeskJet 1200C family front panel. This means that they will be reset to the factory default values after a power cycle.

Variables Not Stored in NVRAM	
COPIES	PAGEPROTECT
FORMLINES	PAPER
MEDIASOURCE	PRINTQUALITY
MEDIATYPE	RENDERMODE
ORIENTATION	RESOLUTION

Printer Status Readback

Printers that support printer status readback:
HP DeskJet 1600C, 1600M

Because the DeskJet 1600C and 1600CM do not support USTATUS or INFO, only the requested status information will come back from the printer.

Commands That Affect Printer Memory

Printers affected by memory reconfiguration:
HP DeskJet 1600C, 1600M

Three conditions may cause the printer to reconfigure user memory:

- When the printer language changes, either explicitly by using the ENTER command, or implicitly.
- When the page protection setting changes, either using the SET, DEFAULT, or RESET commands.
- When the resolution is changed using either the SET or DEFAULT commands.

Reconfiguring printer memory may erase all volatile personality-specific resource information, including downloaded fonts, PCL macros, and PostScript dictionaries (however no I/O data is lost). Memory can be reconfigured only when these conditions actually change the page protection, resolution, or printer language status. For example, if the resolution is at 600 dpi and an application sends the @PJL SET RESOLUTION = 600 command, memory is not reconfigured.

Resource Saving

None of the DeskJet 1200C or 1600C printer families support resource saving.

Printer Specific Job Boundaries

Printers that support printer specific job boundaries:
HP DeskJet 1200C, 1200CM, 1600C, 1600CM

Unlike the LaserJet 4 family of printers, no implicit PJL job boundaries are recognized. There are no additional conditions which will cause the User Default Environment values to be loaded into the PJL Current Environment, or (subsequently) to be loaded into the Modified Print Environment.

Timeouts

Printers that support printer timeouts:
HP DeskJet 1600C, 1600CM

These printers have a timeout capability which is used to recover when jobs are interrupted by situations such as host failures. The timeout duration varies depending on the data received by the printer.

The TIMEOUT variable set using PJL establishes the I/O timeout durations to wait before switching to another pending I/O. If the printer has not received printable data, it will wait for the TIMEOUT duration before closing the current job and switching to another pending I/O. If the printer has received printable data and is waiting for more data, the printer uses an extended timeout duration, which is equal to five minutes or ten times the TIMEOUT value, whichever is greatest.

HP LaserJet 5Si/ 5SiMx/5Si Mopier Comments

HP LaserJet 5Si, 5SiMx, and 5Si Mopier printers have several features that differentiate them from most of the other LaserJet printers. The following features should be kept in mind when writing PJL code for these printers.

- Three standard paper input sources are provided (two 500-sheet paper cassettes and a 100-sheet multi-purpose tray).
- Input selection can be controlled by selecting a media type rather than a particular input tray—this feature is controlled using PCL, instead of PJL, but it may affect the manner in which PJL code is written (see the *PCL 5 Comparison Guide* for more information concerning this feature).
- Jobs may be canceled using the printer control panel. If unsolicited status is enabled when jobs are canceled, the printer responds with a status message (see the “Job Cancellation” section in Chapter 5 for more information).
- A PCL and PostScript-supported disk accessory is available for storing information such as fonts and macros. Chapter 9 describes the PJL file system that manages the files on the printer disk.
- The default symbol set is PC-8 instead of Roman-8.
- The LaserJet 5Si and 5SiMx printers have a top (correct-order) output tray, holding 500 pages, and a side (100-sheet face-up) output tray.
- The LaserJet 5Si Mopier printer has a top (correct-order) output tray, holding 500 pages, a side (100-sheet face-up) output tray, a multi-bin mailbox (5 bins) and a stapler bin. (See the following page for instructions on stapling or collating documents.)

HP LaserJet 5Si Mopier Comments

PJL commands are used to specify the destination bin and control printer functions such as stapling and collating multiple copies.

Specifying the Output Bin

Documents are sent to specific output bins using the @PJL SET OUTBIN command. The HP LaserJet 5Si Mopier bin definitions are as follows:

Bin Description	**OUTBIN Variable Name**
Engine face-down bin	UPPER
High Capacity Output (HCO) face-up bin	OPTIONALOUTBIN1
Stapling bin (in *mailbox* mode)	OPTIONALOUTBIN7
Stapling bin (in *stacker* or *job-separator* modes)	OPTIONALOUTBIN3
First non-stapling bin in mailbox mode (only bin in stacker and job-separator modes)	OPTIONALOUTBIN2
Last non-stapling bin (bottom bin in mailbox mode)	OPTIONALOUTBIN6

Stapling Documents

To staple a document, include the following PJL command in the PJL header at the beginning of the job (see the example on the following page):

```
@@PJL SET FINISH=STAPLE
```

To staple the output using this command, the printer automatically determines which bin is the stapling bin, so the output bin does not need to be specified using the @PJL SET OUTBIN command. The printer uses the EOJ command to determine the end of job so that the job can be stapled correctly.

Note Future printers may enable stapling using a different command sequence.

Collating Multiple Copies

Multiple “mopies” of a job can be printed by sending the @PJL SET QTY command, followed by one copy of the job. This saves network traffic because only one copy must be sent to the printer. The printer stores the job on the internal disk drive and then prints the desired number of collated copies without additional downloading.

In order to print multiple copies of the job this way, it is important that the print job not include the printer language's *number of copies* command in the data stream (such as the PCL command Ec&l#X). These commands produce uncollated copies.

When printing multiple copies of a job, use the @PJL SET QTY as early as possible in the job. If the printer does not detect that a job is to be mopied by the end of the formatting of the second page (to allow for one banner page), the job will not be mopied.

The following example would print 5 collated, stapled copies of a print job.

```
<ESC>%-12345X@PJL <CR><LF>
@PJL JOB NAME = "Job #12345" <CR><LF>
@PJL COMMENT *** Set Mopies to 5 *** <CR><LF>
@PJL SET QTY = 5 <CR><LF>
@PJL COMMENT ** Send to stapler bin **<CR><LF>
@PJL SET FINISH = STAPLE
  <ESC>%-12345X@PJL <CR><LF>
  @PJL ENTER LANGUAGE = PCL <CR><LF>
  <ESC>E ... PCL print data ... <ESC>E
  ↵<ESC>%-12345X
↵<ESC>%-12345X@PJL <CR><LF>
@PJL EOJ NAME = "Job #12345" <CR><LF>
<ESC>%-12345X
```

HP LaserJet 4000 and 5000 Series Comments

The LaserJet 4000 and 5000 series printers have a PJL feature set similar to the LaserJet 5Si/5SiMx printers. Listed below are some of the differences between the printers.

In addition to the LaserJet 5Si/5SiMx printer features, the LaserJet 4000 and 5000 series printers have:

- 1200 dpi print resolution
- Support for the Czechoslovakian, Hungarian, and Russian languages
- Support for slightly different paper sizes
- More Resolution Enhancement technology (REt) settings
- Support for the CLEARABLEWARNINGS, COURIER, MPTRAY, REPRINT, and WIDEA4 environment variables

I/O Buffer Variables

Reconfiguring the size of the LaserJet 4000 and 5000 series I/O buffers via the data stream can be difficult. The user may try to send data to the printer while the I/O buffers are being reconfigured, which results in the data being consumed until the reconfiguration is complete. While it is not anticipated that these commands will be used often, it is expected that they will be used at least occasionally. For this reason, a special communication sequence has been proposed between the printer and this software, so that the I/O buffers may be reconfigured via the data stream without I/O being lost.

The following sequence assumes that the printer is idle. Any I/O being sent by other users will be lost.

1 The software sends the job which includes a PJL command changing the configuration of the I/O buffers.

2 The software also sends an @PJL ECHO command at the end of the job, followed by a UEL command.

3 The printer sends the echo command back to the host.

4 After the end of the job, the printer goes offline and reconfigures the I/O buffers.

5 The software may resume sending data after it sees the printer go back online.

6 If the software does not detect the printer going offline and then back online within 5 seconds of the echo, the application may assume there is a printer error.

Paper Tray Configuration

The LaserJet 4000 and 5000 series paper tray configurations are set up as follows:

Tray Number	Description
0	Multi-purpose tray
1	Manual feed tray
2	Unknown tray
4	Envelope feeder
x	Other trays (see below)

Other trays are dynamically assigned at power-up, based on the tray's number (for example, if you have a LaserJet 4000 or 5000 series printer with an optional tray, tray 1 (MP tray) would be 0, the first cassette number 2, the second cassette number 3, and the optional cassette number 5 (number 4 is reserved for the envelope feeder).

HP LaserJet 1100 Series Comments

The HP LaserJet 1100 series printers have a PJL feature set very similar to the HP LaserJet 6L printer. Listed below are some of the differences.

- The INFO VARIABLES command returns the number of pages that have been copied, printed, and scanned (COPYPAGECOUNT, PRINTPAGECOUNT, and SCANPAGECOUNT).
- For the LaserJet 1100 series printers, the RESET command does not initialize the PAGECOUNT, SYMSET, and PAPER variables. Instead, it sets the current value equal to the stored default value.
- When a SET or DEFAULT command is used with the AUTOCONT or DENSITY variables, the User Default and PJL Current Environment settings are not modified as they are on most LaserJet printers.
- For the LaserJet 1100 series printers, the INITIALIZE command does not reset the PJL variables stored in NVRAM back to the factory values. It sets their current values to the stored default values (see the following paragraph).
- The HP LaserJet 1100 PJL variables can be set to factory values by performing a control panel NVRAM INIT. This is done by holding down the control panel button and cycling the power. When the power comes on, continue to hold down the control panel button. The LEDs will flash briefly when the power comes on, and then will go off. Hold the button down until the LEDs cycle once, then release the button.

HP LaserJet 2100 Series Comments

The HP LaserJet 2100 series printers have PJL features similar to the HP LaserJet 6P and 6MP printers. Some of the differences are listed below:

- Instead of using the MPTRAY variable, use the INTRAY1 variable to set the default configuration of Tray 1 (the MP Tray).
- The HP LaserJet 2100 series printers add the PCL-specific LINETERMINATION variable, which allows the carriage return, line feed, and form feed characters to be remapped (see the LINETERMINATION variable description in Chapter 6).

HP Color LaserJet 4500 Series Comments

This section describes some of the distinguishing PJL features of the HP Color LaserJet 4500 series printers.

- The JOBID variable is added to enable or disable the job ID information returned in the status readback at the start and end of jobs.
- HP Color LaserJet 4500 series printers may remove the `JOB DISPLAY = "`*`display text`*`"` message from the control panel display before the last page reaches the output bin.
- The control panel display messages and status readback text can now be set to the Japanese language.
- The OUTTONER variable determines how the printer processes a toner-out event. If this variable is set to STOP, printing will stop when a toner-out event occurs. If this variable is set to CONTINUE, a toner-out message will be generated, but printing will continue. The default value for this variable is STOP.
- The PLANESINUSE variable defines the number of planes of data in a job. A value of 1 indicates a monochrome job, while a value of 3 indicates a color job. The default value is 3.
- This printer adds some new POWERSAVETIME values (1, 240, 480 minutes), and does not support the 15 and 180 minute values.

HP LaserJet 8000 and 8100 Series Comments

The PJL feature set used by the HP LaserJet 8000 and 8100 series printers is similar to that of the HP LaserJet 4000 series printers. The HP LaserJet 8100 also adds support for a few more paper sizes (ROC8K, ROC16K, and JISEXEC) and adds job management features (PROOF and HOLD jobs — see Chapter 10 for more information on job management PJL commands).

HP Color LaserJet 8500 Series Comments

As part of its paper stacking flexibility, the HP Color LaserJet 8500 printer allows the user to switch the Mail Box Mode (MBM) to any of the following three settings:

- Stacker
- Separator
- Mailbox

The preferred way to change the Mail Box Mode is using the printer's control panel. This feature is usually controlled by the printer administrator and can be programmatically set using HP JetAdmin.

B PJL Command Summary

COMMENT

```
@PJL COMMENT <words> [<CR>]<LF>
```

DEFAULT

```
@PJL DEFAULT [LPARM : personality | IPARM : port]
↩variable = value [<CR>]<LF>
```

DINQUIRE

```
@PJL DINQUIRE [LPARM : personality | IPARM : port]
↩variable [<CR>]<LF>
```

DINQUIRE *Response*

```
@PJL DINQUIRE [LPARM:personality | IPARM:port]
↩variable <CR><LF>
value <CR><LF>
<FF>
```

ECHO

```
@PJL ECHO [<words>] [<CR>]<LF>
```

ECHO *Response*

```
@PJL ECHO [<words>] <CR><LF>
<FF>
```

ENTER

```
@PJL ENTER LANGUAGE = personality [<CR>]<LF>
```

EOJ

```
@PJL EOJ [NAME = "job name"] [<CR>]<LF>
```

FSAPPEND

```
@PJL FSAPPEND FORMAT:BINARY SIZE=integer
⤷NAME = "pathname" [<CR>]<LF>
<binary data><ESC>%-12345X
```

FSDELETE

```
@PJL FSDELETE NAME = "pathname" [<CR>]<LF>
```

FSDIRLIST

```
@PJL FSDIRLIST NAME = "pathname" ENTRY=integer
⤷COUNT=integer[<CR>]<LF>
```

FSDIRLIST *Response*

```
@PJL FSDIRLIST NAME = "pathname"
⤷ENTRY=integer[<CR>]<LF>
filename TYPE=FILE SIZE=integer<CR><LF>
filename TYPE=DIR<CR><LF>
...
<FF>
```

FSDOWNLOAD

```
@PJL FSDOWNLOAD FORMAT:BINARY SIZE=integer
⤷NAME = "pathname" [<CR>]<LF>
<binary data><ESC>%-12345X
```

FSINIT

```
@PJL FSINIT VOLUME = "pathname" [<CR>]<LF>
```

FSMKDIR

```
@PJL FSMKDIR NAME = "pathname" [<CR>]<LF>
```

FSQUERY

```
@PJL FSQUERY NAME = "pathname" [<CR>]<LF>
```

FSQUERY *Response*

```
If pathname is a file:
@PJL FSQUERY NAME="pathname" TYPE=FILE
⮐SIZE=integer<CR><LF>
<FF>

If pathname is a directory:
@PJL FSQUERY NAME="pathname" TYPE=DIR<CR><LF>
<FF>
```

FSUPLOAD

```
@PJL FSUPLOAD NAME = "pathname" OFFSET=<number>
SIZE=<number>[<CR>]<LF>
```

FSUPLOAD *Response*

```
If the pathname is valid:
@PJL FSUPLOAD FORMAT:BINARY NAME = "pathname"
⮐OFFSET=<number> SIZE=<number><CR><LF>
<SIZE bytes of file data>
<FF>
```

INFO

```
@PJL INFO category [<CR>]<LF>
```

INFO *Response*

```
@PJL INFO category <CR><LF>
[1 or more lines printable characters or <WS>
followed by <CR><LF>]
<FF>
```

INITIALIZE

```
@PJL INITIALIZE [<CR>]<LF>
```

INQUIRE

@PJL INQUIRE [LPARM : *personality* | IPARM : *port*]
↪*variable* [<CR>]<LF>

INQUIRE *Response*

@PJL INQUIRE [LPARM:*personality* | IPARM:*port*]
↪*variable* <CR><LF>
value <CR><LF>
<FF>

JOB

@PJL JOB [NAME="*job name*"][START=*first*
↪*page*][END=*last page*][PASSWORD = *number*] <CR><LF>

OPMSG

@PJL OPMSG DISPLAY = "*message*" [<CR>]<LF>

PJL

@PJL [<CR>]<LF>

RDYMSG

@PJL RDYMSG DISPLAY = "*message*" [<CR>]<LF>

RESET

@PJL RESET [<CR>]<LF>

SET

@PJL SET [LPARM : *personality* | IPARM : *port*]
↪*variable* = *value* [<CR>]<LF>

STMSG

@PJL STMSG DISPLAY = "*message*" [<CR>]<LF>

STMSG *Response*

@PJL STMSG DISPLAY="*message*" <CR><LF>
key <CR><LF>
<FF>

UEL

<ESC>%-12345X

USTATUS

@PJL USTATUS *variable* = *value* [<CR>]<LF>

Unsolicited Status Message (not a response, but returned when printer events occur)

@PJL USTATUS *variable* <CR><LF>
[1 or more lines of printable characters or <WS>
followed by <CR><LF>]
<FF>

USTATUSOFF

@PJL USTATUSOFF [<CR>]<LF>

C Programming Examples

Introduction

This appendix demonstrates two examples: one PJL example using the C programming language, and one simple batch file. The first example is listed on the left-facing page in the generic format used throughout the rest of the manual. The C code is then listed on the opposite page so that you can compare the C code with the generic code. The second example is a batch file that demonstrates the use of the RDYMSG command to create your own “ready” message while printing your job.

Note For information about products newer than those included in this book, see the *Printer Job Language Technical Reference Addendum*, which includes product-specific information about newer products, as well as commands and variables added to PJL to support these newer products.

Example: Switching Printer Languages

The job in this example prints two pages: one in PCL and one in PostScript. The program first enters PCL, and then immediately enters HP-GL/2 to draw a box and print “PCL Print Job.” Next, PostScript is entered and PostScript data is sent to the printer to draw a box and print “PostScript Job.”

```
<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT **Beginning of PCL Job** <CR><LF>
@PJL COMMENT **Enter PCL (& HP-GL/2)* <CR><LF>
@PJL ENTER LANGUAGE = PCL <CR><LF>
<ESC>E<ESC>%0BIN;SP1;PA1010,1010;PW2.2;
↵PD5310,1010,5310,5310,1010,5310,1010,1010;
↵PU;PA2280,3040;
↵SD1,277,2,1,4,20,5,0,6,0,7,4148;
↵DT*;SS;LBPCL Print Job*;
↵<ESC>%0A<FF><ESC>E
↵<ESC>%-12345X@PJL <CR><LF>
@PJL COMMENT *** END OF PCL JOB & *** <CR><LF>
@PJL COMMENT ** START OF POSTSCRIPT * <CR><LF>
@PJL ENTER LANGUAGE = POSTSCRIPT <CR><LF>
5 setlinewidth<CR>
100 100 moveto<CR>
0 300 rlineto<CR>
300 0 rlineto<CR>
0 -300 rlineto<CR>
closepath<CR>
stroke<CR>
185 240 moveto<CR>
/Helvetica findfont 20 scalefont setfont<CR>
(PostScript Job) show<CR>
showpage<CR>
^D
↵<ESC>%-12345X
```

Notice the %% required to print the % character

```
/**************************************************/
/*      SWITCH.C  (Switching Printer Languages)      */
/**************************************************/
#include <stdio.h>
main()
{
      FILE *prn;  /* initialization section */
      /************ open PRN for writing **************/
      prn = fopen("lpt1","wb");
      /****** Send UEL command and @PJL<CR><LF> *****/
      fprintf(prn,"\033%%-12345X@PJL \n");
      fprintf(prn,"@PJL COMMENT **Beginning of PCL Job** \n");
      fprintf(prn,"@PJL COMMENT **Enter PCL (& HP-GL/2)* \n");
      fprintf(prn,"@PJL ENTER LANGUAGE = PCL \n");
      fprintf(prn,"\033E\033%%0BIN;SP1;PA1010,1010;PW2.2;");
      fprintf(prn,"PD5310,1010,5310,5310,1010,5310,1010,1010;");
      fprintf(prn,"PU;PA2280,3040;");
      fprintf(prn,"SD1,277,2,1,4,20,5,0,6,0,7,4148;");
      fprintf(prn,"DT*;SS;LBPCL Print Job*;"); /** Print text **/
      fprintf(prn,"\033%%0A\f\033E"); /*Exit HP-GL/2, <FF>, <Esc>E*/
      fprintf(prn,"\033%%-12345X@PJL \n"); /*** UEL & @PJL ***/
      fprintf(prn,"@PJL COMMENT *** END OF PCL JOB & *** \n");
      fprintf(prn,"@PJL COMMENT ** START OF POSTSCRIPT * \n");
      fprintf(prn,"@PJL ENTER LANGUAGE = POSTSCRIPT \n");
      fprintf(prn,"5 setlinewidth\r"); /** PostScript Code **/
      fprintf(prn,"100 100 moveto\r");
      fprintf(prn,"0 300 rlineto\r");
      fprintf(prn,"300 0 rlineto\r");
      fprintf(prn,"0 -300 rlineto\r");
      fprintf(prn,"stroke\r");
      fprintf(prn,"185 240 moveto\r");
      fprintf(prn,"/Helvetica findfont 20 scalefont setfont\r");
      fprintf(prn,"(PostScript Job) show\r"); /** Print text **/
      fprintf(prn,"showpage\r");
      fprintf(prn,"\004"); /**** ^D *******/
      fprintf(prn,"\033%%-12345X"); /*** UEL Command ***/

      fclose(prn);
}
```

Example: Using RDYMSG in a Batch File

This example demonstrates how to use a batch file to send PJL commands to the printer. In this example, the batch file acts as a spooler, using the RDYMSG command to display the file name while a print file is being downloaded.

To send PJL commands this way, first create an ASCII file named UEL, containing *only* the UEL command (<ESC>%-12345X). In this file, be sure to substitute ASCII character 27, the escape character, for <ESC>, and do not add any spaces or characters after the X.

Then create a batch file as shown here, and save it as PRINTPJL.BAT, in the same directory as the “UEL” file. The batch file uses the DOS ECHO command to send PJL commands and the DOS COPY command with the /B option to send the UEL file and pre-existing PRN file to the printer.

```
@ECHO OFF
CLS
ECHO Printing the %1 Job!
COPY UEL /B PRN:
ECHO @PJL > PRN:
ECHO @PJL JOB > PRN:
ECHO @PJL JOB DISPLAY = "%1" > PRN:
ECHO @PJL RDYMSG DISPLAY = "%1" > PRN:
ECHO @PJL ENTER LANGUAGE = PCL > PRN:
COPY %1 /B PRN:
COPY UEL /B PRN:
ECHO @PJL COMMENT Restore READY message > PRN:
ECHO @PJL RDYMSG DISPLAY = "" > PRN:
ECHO @PJL EOJ > PRN:
COPY UEL /B PRN:
@ECHO ON
```

Note For the HP LaserJet 4000 printer, and newer printers, the RDYMSG DISPLAY method will not replace the front panel display message. Use the JOB DISPLAY = “display text” method. Use both methods to ensure compatibility with all printers. See page 8-2.

To use this batch file, type the name of the batch file, followed by the name of the print file, as follows:

```
PRINTPJL printfilename
```

The *printfilename* is displayed while the job is being downloaded to the printer.

D PJL Status Codes

The status codes listed in this appendix are sent to the host in many of the status readback responses as "CODE = xxxxx," where each "x" stands for a single digit 0 through 9. For example, if unsolicited status is enabled and the toner runs low, the following message is returned:

```
@PJL USTATUS DEVICE
CODE=10006
DISPLAY="16 TONER LOW"
ONLINE=TRUE
```

If you consult the status code table, code 10006 means "toner low." Note that since the string portion of the "DISPLAY=string" is localized, developers should use the "CODE=" value in applications.

Note For information about products newer than those included in this book, see the *Printer Job Language Technical Reference Addendum*, which includes product-specific information about newer products, as well as commands and variables added to PJL to support these newer products.

Status Code Groupings

PJL status codes are grouped as follows, with the first two digits indicating a message category:

- Informational Messages (10xxx)
- Background Paper Mount (11xyy)
- Background Paper Tray Status (12xyy)
- Output Bin Status (15xxy)
- PJL Parser Errors (20xxx)
- PJL Parser Warnings (25xxx)
- PJL Semantic Errors (27xxx)
- Auto-Continuable Conditions (30xxx)

- PJL File System Errors (32xxx)
- Possible Operator Intervention Conditions (35xxx)
- Operator Intervention Required (40xxx)
- Foreground Paper Mount (41xyy)
- Paper Jam Errors (42xyy)
- Optional (External) Paper Handling Device Errors (43xyy)
- LaserJet 4000/5000 Paper Jam Information (44xyy)
- Hardware Errors (50xxx)

The following pages list the status codes in numerical order, by groups. For a complete description of each control panel display string, see the user and service manuals for each printer.

Informational Messages (10xxx) *

Status Code	Control Panel Display String or Code Meaning
10001	00 READY (online) [Personality-specific ready message] (online) [PJL RDYMSG] (online) 68 READY/SERVICE (online) or PERFORM USER MAINTENANCE or 68 NVRAM FULL, SETTINGS NOT SAVED
10002	00 READY (offline) or [Personality-specific ready message] (offline) or [PJL RDYMSG] (off-line) or 68 READY/SERVICE (offline). Form-feeding printable data due to key press
10003	02 WARMING UP (or initializing—DesignJet)
10004	05 SELF TEST or INTERNAL TEST
10005	07 RESET, CLEARING MEMORY
10006	16 TONER LOW
10007	CANCELING JOB
10010 **	STATUS BUFFER OVERFLOW

* All of these messages are localized. They appear in the currently selected language as displayed on the control panel.

** If creating applications for the HP LaserJet 4 and 5 printer families, see “Printer Status Readback” in the “HP LaserJet 4 and 5 Family Comments” section in Appendix A.

Status Code	Control Panel Display String or Code Meaning
10013	04 SELF TEST
10011	18 AUX IO INIT or 18 AUX IO NT RDY or 18 MIO INIT or 18 MIO NOT RDY or HP MIO1 INITIALIZING or HP MIO2 INITIALIZING or HP MIO1 NOT READY or HP MIO2 NOT READY or HP MIO INITIALIZING
10014	06 PRINTING TEST or PRINTING CONFIGURATION PAGE or INTERNAL TEST, then PRINTING CONFIGURATION PAGE
10015	06 TYPEFACE LIST or PRINTING FONT LIST
10016	15 ENGINE TEST
10017	06 DEMO PAGE or PRINTING DEMO PAGE
10018	09 MENU RESET or RESETTING MENUS TO DEFAULTS
10019	09 RST ACTIVE IO or RESETTING ACTIVE IO
10020	09 RESET ALL I/O
10021	08 COLD RESET or RESTORING FACTORY SETTINGS
10022	06 CONFIG PAGE or PRINTING CONFIGURATION PAGE
10023	PROCESSING JOB or PROCESSING JOB FROM ENV FEEDER or PROCESSING JOB FROM TRAY X (X = tray code)
10024	PRESS SELECT TO FORMFEED or DATA RECEIVED
10025	ACCESS DENIED
10026	NO JOB TO CANCEL
10027	CLEARING PAPER PATH
10028	PRINTING ERROR LOG
10029	FORMFEEDING

Status Code	Control Panel Display String or Code Meaning
10030	Job message — a print job has been received containing the optional DISPLAY="message" token pair associated with the PJL JOB command.
10031	ENGINE CLEANING

Background Paper Loading (11xyy)

Background paper loading messages appear when a paper input source is out of paper, but another paper source is available and loaded with the correct paper size. The printer stays online in these situations since it can switch to the other paper source. (“Foreground” paper loading messages are sent when there are no alternate paper sources loaded with the same size paper. The printer goes offline and waits for someone to load paper. Foreground error messages are listed later in the chapter [41xyy].)

Background paper loading messages are in the format 11*xyy*. The following tables list the *x* and *y* values for these messages. For example, 11202 is a background paper loading message indicating to load the PC tray with letter-size paper.

X = Tray Code	Tray
0	MP Tray or Multi-Purpose Tray1 or Duplex tray
1	Manual Feed
2	PC Tray or Upper Cassette or Universal Tray2
3	LC Tray or Lower Cassette or Universal Tray3
4	EE Tray or Envelope Feeder
5	Any HCI Tray

YY = Media Code	Media Size
00	Unknown Paper
01	Unknown Envelope
02	Letter Paper
03	Legal Paper
04	A4 Paper
05	Executive Paper
06	Ledger Paper
07	A3 Paper
08	COM10 Envelope
09	Monarch Envelope
10	C5 Envelope
11	DL Envelope
12	Japan B4 Paper
13	Japan B5 Paper
14	B5 Envelope
15	Custom Media Paper
16	J-Postcard
17	J-RoundTrip Postcard
18	A5 Paper
19	Letter-R Paper
20	A4-R Paper
21	A5-R Paper
22	Japan B5-R Paper
23	Exec-R Paper
24	A6 Paper
25	Foolscap Paper
26	Japan B6 Paper

Background Paper Tray Status (12xyy)

Background paper tray status messages occur when a tray is open or a tray is lifting. Background paper tray status messages are in the format 12*xyy*. The following tables list the *x* and *y* values for these messages. For example, 12301 indicates the lower cassette tray is open.

X = Tray Code	Tray
0	MP Tray or Multi-Purpose Tray1
1	Manual Feed
2	PC Tray or Upper Cassette or Universal Tray2
3	LC Tray or Lower Cassette or Universal Tray3
4	EE Tray or Envelope Feeder
5	Any HCI Tray

YY = Status Code	Tray Status
01	Tray Open
02	Tray Lifting

Output Bin Status (15xxy)

Output bin status messages occur when an output bin is full. The messages are in the format 15*xxy*. The following tables list the *x* and *y* values for these messages. For example, 15031 indicates that output bin number 3 is full.

XX = Output Bin	Tray
0 - 99	Output Bin Number

Y = Status Code	Tray Status
1	Output Bin Full
2	Output Bin Open
3	Output Bin Broken

PJL Parser Errors (20xxx)

These status codes denote PJL parser errors. The entire PJL command line is ignored. (Some of the status codes refer to portions of PJL commands such as “command modifiers” and “alphanumeric values.” For a description of the PJL command format, see “Format of PJL Commands” in Chapter 2.)

Status Code	Display String or Code Meaning
20001	Generic syntax error (entire PJL command ignored)
20002	Unsupported command
20004	Unsupported personality, system, or I/O port
20005	PJL command buffer overflow
20006	Illegal character or line terminated by the Universal Exit Language command
20007	<WS> or [<CR>]<LF> missing after closing quotes
20008	Invalid character in an alphanumeric value
20009	Invalid character in a numeric value
20010	Invalid character at the start of a string, alphanumeric value, or numeric value

Status Code	Display String or Code Meaning
20011	String missing closing double-quote character
20012	Numeric value starts with a decimal point
20013	Numeric value does not contain any digits
20014	No alphanumeric value after command modifier
20015	Option name and equal sign encountered, but the value field is missing
20016	More than one command modifier
20017	Command modifier encountered after an option (command modifier must precede option)
20018	Command not an alphanumeric value
20019	Numeric value encountered when an alphanumeric value expected
20020	String encountered when an alphanumeric value expected
20021	Unsupported command modifier
20022	Command modifier missing
20023	Option missing
20024	Extra data received after option name (used for commands like SET that limit the number of options supported)
20025	Two decimal points in a numeric value
20026	Invalid binary value

PJL Parser Warnings (25xxx)

This group of status codes denote PJL parser warnings, which indicates that part of the PJL command is ignored.

Status Code	Display String or Code Meaning
25001	Generic warning error (part of the PJL command ignored)
25002	PJL prefix missing
25003	Alphanumeric value too long
25004	String too long
25005	Numeric value too long
25006	Unsupported option name
25007	Option name requires a value which is missing
25008	Option name requires a value of a different type
25009	Option name received with a value, but this option does not support values
25010	Same option name received more than once
25011	Ignored option name due to value underflow or overflow
25012	Value for option experienced data loss due to data conversion (value truncated or rounded)
25013	Value for option experienced data loss due to value being out of range; the value used was the closest supported limit
25014	Value is of the correct type, but is out of range (value was ignored)
25016	Option name received with an alphanumeric value, but this value is not supported
25017	String empty, option ignored
25018	A Universal Exit Language command was expected but not found.

PJL Semantic Errors (27xxx)

This group of status codes denote PJL semantic errors. As much of the command is executed as possible, depending on the current configuration of the printer.

Status Code	Display String or Code Meaning
27001	Generic semantic error
27002	EOJ command encountered without a previously matching JOB command. An EOJ command does not have a matching JOB command if the number of valid EOJ commands received is greater than the number of valid JOB commands received.
27003	Password protected—attempted to change NVRAM value when password is set and the job is not a secure PJL job.
27004	Cannot modify the value of a read-only variable.
27005	Can only use DEFAULT with this variable; cannot use SET.
27006	Attempted to pass a NULL string to a command or command option that requires the string to contain at least one character.
27007	Attempted to DEFAULT a variable which can only be SET.

Auto-Continuable Conditions (30xxx)

This list specifies the set of PJL error codes and corresponding control panel display strings for auto-continuable conditions. If no action is taken, the device automatically continues if auto-continue is set to true (except for 30035 and 30036 errors).

Status Code	Display String or Code Meaning
30010 *	STATUS BUFFER OVERFLOW
30016	20 MEM OVERFLOW or 20 MEMORY OVERFLOW DATA LOST or 20 INSUFFICIENT MEMORY, PRESS GO KEY
30017	21 PRINT OVERRUN or 21 PRINT OVERRUN DATA LOST or 21 PAGE TOO COMPLEX
30018	40 ERROR or 40.1 HP MIO 1 ERROR or 40.2 HP MIO 2 ERROR or 40 SER IO ERROR
30027	22 I/O CONFIG ERROR or 22 SER IO ERROR 22 HP MIO 1 IO ERROR CHECK SETUP or 22 HP MIO 2 IO ERROR CHECK SETUP or 22 PARALLEL IO ERROR CHECK SETUP
30034	41.x ERROR or 41.3 PAPER ERROR
30035	68 ERROR CHECK CONFIGURATION or 68 NVRAM ERROR, SETTINGS NOT SAVED or 68 ERROR
30036	68 SERVICE or 68 NVRAM FULL CHECK CONFIGURATION or 68 NVRAM ERROR, SETTINGS NOT SAVED
30072	49 REMOVE PAGE
30076	PERSONALITY MEMORY OVERFLOW/ OUT OF MEMORY
30094	41.1 GENERAL MISPRINT ERROR
* If creating applications for the HP LaserJet 4 and 5 printer families, see “Printer Status Readback” in the “HP LaserJet 4 and 5 Printer Family Comments” section in Appendix A.	

Status Code	Display String or Code Meaning
30095	41.2 BEAM DETECT MALFUNCTION
30096	41.3 IMPROPER PAPER SIZE or 41.3 UNEXPECTED PAPER SIZE
30097	41.4 NO VIDEO SYNC
30098	41.5 NOISY VIDEO SYNC REQ SIGNAL
30099	INVALID INPUT SOURCE
30100	INVALID OUTPUT DESTINATION
30101	BINDING AGENT OUT OF SUPPLIES
30102	BINDING AGENT MEDIA MISALIGNMENT
30103	BINDING AGENT MEDIA CAPACITY EXCEEDED
30104	EXTERNAL INPUT DEVICE PAPER PATH ERROR
30105	EXTERNAL OUTPUT DEVICE PAPER PATH ERROR
30106	EXTERNAL INPUT DEVICE OPERATIONAL ERROR
30107	EXTERNAL OUTPUT DEVICE OPERATIONAL ERROR
30108	40 HP MIO ERROR, PRESS GO KEY
30109	40 BAD SERIAL DATA FORMAT, PRESS GO KEY
30110	22 HP MIO ERROR, PRESS GO KEY
30111	22 PARALLEL IO ERROR, PRESS GO KEY
30112	22 SERIAL IO ERROR, PRESS GO KEY
30113	STOPPING CHECK LAST PAGE
30114	PRESS SELECT TO CANCEL JOB
30119	MEDIA FEED ERROR

PJL File System Errors (32xxx)

This list specifies the set of error codes for the PJL file system.

Status Code	Display String or Code Meaning
32000	General error
32001	Volume not available
32002	Disk full
32003	File not found
32004	No free file descriptors
32005	Invalid number of bytes
32006	File already exists
32007	Illegal name
32008	Can't delete root
32009	File operation attempted on a directory
32010	Directory operation attempted on a file
32011	Not same volume
32012	Read only
32013	Directory full
32014	Directory not empty
32015	Bad disk
32016	No label
32017	Invalid parameter
32018	No contiguous space
32019	Can't change root
32020	File Descriptor obsolete
32021	Deleted
32022	No block device

Status Code	Display String or Code Meaning
32023	Bad seek
32024	Internal error
32025	Write only
32026	Write protected
32027	No filename
32051	End of directory
32052	No file system
32053	No memory
32054	Vol name out of range
32055	Bad FS
32056	Hardware failure

Potential Operator Intervention Conditions (35xxx)

This list specifies the set of PJL error codes and corresponding control panel display strings for conditions where operator intervention may be required. The device says “online” and continues to operate, possibly with reduced functionality. Data may be lost.

Status Code	Display String or Code Meaning
35028	BAD MIO
35029	W1 IMAGE ADAPT or IMAGE ASSIST or MEMORY LOW, PAGE SIMPLIFIED
35030	WA JOB ALTERED
35031	W2 INVALID PERS or REQUESTED LANGUAGE NOT AVAILABLE
35032	WL WARNINGS LOST
35037	W3 JOB ABORTED or CANCELING JOB or INSUFFICIENT MEMORY, JOB CLEARED
35039	W9 JOB 600/LTR
35040	W0 JOB 600/A4

Status Code	Display String or Code Meaning
35041	W8 JOB 600/OFF
35042	W7 JOB 300/LGL*
35043	W5 JOB 300/LTR*
35044	W6 JOB 300/A4*
35045	W4 JOB 300/OFF*
35073	WM CHK MEM CNFIG or MEMORY SETTINGS CHANGED
35074	WM MEM CNFIG N/A
35075	USER MAINTENANCE REQUESTED
35076	WM *personality* MEM FULL or XXXX MEMORY FULL, STORED DATA LOST
35078	Entered powersave mode (00 POWERSAVE) or POWERSAVE ON
35081	WM JOB 300
35082	WD DISK NOT INIT or *Volume 0* NOT INIT (*Volume 0* will be indicated as either DISK, FLASH, or RAMDISK as appropriate)
35084	WM JOB 600/LGL
35085	WM JOB 600/A3
35086	WM JOB 600/11x17
35087	WM JOB 300/A3*
35088	WM JOB 300/11x17*
35115	*Volume 1* NOT INIT (*Volume 1* is not initialized. *Volume 1* will be indicated as either DISK, FLASH, or RAMDISK as appropriate)
35117	*Volume 2* NOT INIT (*Volume 2* is not initialized. *Volume 2* will be indicated as either DISK, FLASH, or RAMDISK as appropriate.)
* For some printers, the WM JOB 300 message (35081) may be used instead.	

Operator Intervention Conditions (40xxx)

This list specifies the set of PJL error codes and corresponding control panel display strings for conditions where operator intervention is required. Printing cannot continue until the condition is resolved.

Status Code	Display String or Code Meaning
40000	SLEEP MODE (STANDBY)*
40005	Cartridge error during align cartridges (or reading setup sheet—DesignJet)
40010	14 NO EP CART or INSTALL TONER CARTRIDGE or no electrical contact with one or more ink cartridges (DesignJet)
40011	Accessing ink cartridges (DesignJet)
40019	REMOVE PAPER FROM [bin name]
40020	NO MICR TONER or INSTALL MICR TONER CARTRIDGE
40021	12 PRINTER OPEN OR NO EP CART or CLOSE PRINTER COVER (or lower lever or lower window—DesignJet)
40022	13 PAPER JAM or REMOVE PAPER JAM
40024	FE CARTRIDGE
40026	PC INSTALL or INSTALL TRAY 2
40038	16 LOW TONER or TONER LOW or TONER LOW, PRESS GO KEY
40046	FI INSERT CART
40047	FR REMOVE CART
40048	[PJL OPMSG]
40049	[PJL STMSG]
40050	50 SERVICE or 50 FUSER ERROR, CYCLE POWER
40051	51 ERROR or 51 PRINTER ERROR, CYCLE POWER
40052	52 ERROR or 52 PRINTER ERROR, CYCLE POWER
40053	53-xy-zz ERROR
* This is not an error. The printer is waiting for data.	

Status Code	Display String or Code Meaning
40054	54 ERROR
40055	55 ERROR
40056	56 ERROR
40057	57 SERVICE or 57 MOTOR FAILURE, CALL SERVICE
40058	58 SERVICE or FAN MOTOR FAILURE, CALL SERVICE
40059	59 ERROR
40061	61.x SERVICE
40062	62.x SERVICE
40063	63 SERVICE
40064	64 SERVICE or PRINTER ERROR, CYCLE POWER
40065	65 SERVICE
40066	External paper handling device failure
40067	67 SERVICE
40068	69 SERVICE
40069	70 ERROR
40070	71 ERROR
40071	72 SERVICE
40079	PRINTER MANUALLY TAKEN OFFLINE or OFFLINE or FORMFEEDING or SERVICE MODE or 00 OFFLINE
40080	EE INCOMPATIBLE or LC INCOMPATIBLE
40083	FS DISK FAILURE or 311.1.1 DISK FAILURE or *Volume 0* FAILURE (*Volume 0* will be indicated as either DISK, FLASH, or RAMDISK as appropriate)
40089	INCOMPLETE TRAY 3 INSTALLED
40090	INCOMPATIBLE ENVELOPE FEEDER INSTALLED
40092	81 SERVICE (XXX)
40093	REMOVE DUPLEX JAM

Status Code	Display String or Code Meaning
40096	41.3 UNEXPECTED PAPER SIZE CHECK PAPER IN TRAY
40099	56.1 ERROR PRESS SELECT KEY
40100	56.2 ERROR PRESS SELECT KEY
40102	FINISHER ALIGN ERROR [BIN NAME]
40103	FINISH LIMIT REACHED [BIN NAME]
40104	INPUT DEVICE FEED PATH OPEN
40105	OUTPUT DEVICE DELIVERY PATH OPEN
40106	INPUT OPERATION ERROR X.YY
40107	OUTPUT OPERATION ERROR X.YY
40116	*Volume 1* FAILURE (Failure on *Volume 1*. *Volume 1* will be indicated as either DISK, FLASH, or RAMDISK as appropriate)
40118	*Volume 2* FAILURE (Failure on *Volume 2*. *Volume 2* is indicated as either DISK, FLASH, or RAMDISK as appropriate.)
40119	PAPER MISFEED
40120	Open face-up output bin
40121	Close face-up output bin
40122	Duplexer must be installed
40123	Duplexer error, remove duplexer
40124	Bad duplexer connection
40128	DRUM ERROR REPLACE DRUM KIT
40129	DRUM LIFE OUT REPLACE DRUM KIT
40130	DRUM LIFE LOW REPLACE DRUM KIT
40131	TRANSFER KIT OUT REPLACE KIT
40132	TRANSFER KIT LOW REPLACE KIT
40141	WASTE TONER FULL REPLACE DRUM KIT
40142	INSTALL DRUM KIT
40143	REINSTALL TRANSFER BELT
40144	PRESS GO TO PRINT PRESS SELECT TO CHANGE TONER
40146	41.5 UNEXPECTED PAPER TYPE CHECK PAPER IN TRAY

Foreground Paper Loading (41xyy)

Foreground paper loading messages are sent when one of the paper input sources is out of paper and there is no other input source available and loaded with the correct paper size. When this occurs, the printer goes offline until someone loads paper.

The messages are in the format 41xyy. The following tables list the X and Y values for these messages. For example, 41303 is a foreground paper loading message indicating to load the LC tray with legal-size paper.

X = Tray Code	Tray
0	Multi-Purpose Tray or Envelope Tray
1	Manual Feed
2	PC Tray or Universal Tray2
3	LC Tray or Universal Tray3
4	EE Tray or Envelope Feeder
5	Any HCI Tray
9	All Trays Empty

YY = Media Code	Media Size
00	Unknown Paper
01	Unknown Envelope
02	Letter Paper
03	Legal Paper
04	A4 Paper
05	Executive Paper
06	Ledger Paper
07	A3 Paper
08	COM10 Envelope
09	Monarch Envelope
10	C5 Envelope

YY = Media Code	Media Size
11	DL Envelope
12	Japan B4 Paper
13	Japan B5 Paper
14	B5 Envelope
15	Custom Media Paper
16	J-Postcard (or JB4 paper—LaserJet 6P, LaserJet 2100)
17	J-RoundTrip Postcard (or JB5 paper—LaserJet 6P, LaserJet 2100)
18	A5 Paper (or JPostcard—LaserJet 6P
19	Letter-R Paper (or JDoublePostCard—LaserJet 6P, LaserJet 2100)
20	A4-R Paper (or A5 Paper—LaserJet 6P, LaserJet 2100)
21	A5-R Paper
22	Japan B5-R Paper
23	Exec-R Paper
24	A6 Paper
25	Foolscap Paper
26	Japan B6 Paper

Paper Jam Messages (LaserJet 5Si/5SiMx only) (42xyy)

Foreground paper loading messages are sent when one of the paper input sources is out of paper and there is no other input source available and loaded with the correct paper size. When this occurs, the printer goes offline until someone loads paper.

The messages are in the format 42*xyy*, where *x* is the number of jammed pages that need to be cleared and *yy* is the location of the jam that was detected. The following table lists the *y* values for these messages. For example, 42203 indicates 2 pages are jammed in the fuser output.

Y = Jam Location	Tray
0	Non-specific jam
1	Paper feed 1, paper late jam
2	Paper feed 2, paper late jam
3	Fuser output, paper late jam
4	Fuser output, paper stopped jam
5	Face down output, paper late jam
6	Face down output, paper stopped jam
7	2-Sided turn around, paper late jam
8	2-Sided turn around, paper stopped jam
9	2-Sided path, paper late jam
10	2-Sided path, paper stopped jam
11	External input device paper jam
12	External output device paper jam
13	Fuser accordion jam
14	Fuser accordion jam
15	Printer could not auto eject paper

Optional (External) Paper Handling Device Messages (43xyy)

This category contains error messages related to any optional external paper handling devices.

The messages are in the format 43*xyy*, where *x* is the number of the paper handling device and *yy* is the error code.

x = Device	Paper Handling Device
1	First device attached to PHC
2	Second device attached to PHC
3	Third device attached to PHC
4	Fourth device attached to PHC
5	Fifth device attached to PHC

yy = Code	Error Code
1	Unable to communicate with the PHC
2	Out of sequence packet
3	Bad transaction
4	Invalid status bits
5	Invalid status code
6	Invalid device specified
7	Invalid tray specified
8	Invalid bin specified
9	Invalid number of special purpose bytes
10	Invalid number of NVEE bytes
11	General PHC malfunction
12	Bad PHC RAM
13	PHC ROM checksum error
14	Faulty PHC FIFO
15	PHC cannot communicate with device(s)
16	PHC never ready during initialization

yy = Code	Error Code
17	FIFO empty when expecting data
18	FIFO full when tray to send data
19	Invalid page ACK (formatter not expecting a page ACK)
20	Page ACK timeout
21	Inconsistent paper size
22	Wrong page ACK
23	Device(s) never ready during installation
24	Negative ACK of ready tray

LaserJet 4000 / 5000 Series Paper Jam Messages (44xyy)

This category contains unsolicited status error messages related to paper jams (for the LaserJet 4000 and 5000 series printers only). The messages are in the format 44*xyy*, where *x* is the number of sheets in the printer, and *yy* is the location of the jammed sheet.

x	Description
0 – 9	Number of jammed sheets

yy	Jam Location
00	Paper jam in unknown location
01	Paper jam in the paper input area
02	Paper jam in the paper output area (may need to open rear door of printer)
03	Paper jam underneath the top cover. Remove toner cartridge to clear.
04	Paper jam in the duplexer
05	Paper jam in the duplex front cover area
06	Paper jam in the face down output area
07	Paper jam in the front door area

Hardware Errors (50xxx)

These status codes are sent out when a hardware problem exists and the printer is working well enough to send status messages.

Status Code	Display String or Code Meaning
50000	General Hardware Failure
50001	ROM or RAM Error, ROM Checksum Failed (or interface error [DesignJet])
50002	RAM Error, RAM Test Failed (or part malfunction [DesignJet])
50003	Engine Fuser Error
50004	Engine Beam Detect Error
50005	Engine Scanner Error
50006	Engine Fan Error
50007	Engine Communications Error
50008	50.1 FUSER ERROR CYCLE POWER or LOW FUSER TEMPERATURE
50009	50.2 FUSER ERROR CYCLE POWER or FUSER TOOK TOO LONG TO WARM UP
50010	50.3 FUSER ERROR CYCLE POWER or FUSER TOO HOT
50011	50.4 FUSER ERROR CYCLE POWER or BAD FUSER
50012	51.1 ERROR PRESS SELECT KEY or BEAM DETECT MALFUNCTION
50013	51.2 ERROR PRESS SELECT KEY or LASER MALFUNCTION
50014	52.1 ERROR PRESS SELECT KEY or SCANNER STARTUP FAILURE
50015	52.2 ERROR PRESS SELECT KEY or SCANNER ROTATION FAILURE

Status Code	Display String or Code Meaning
50016	57.1 FAN FAILURE CALL SERVICE or FAN MOTOR 1 FAILURE
50017	57.2 FAN FAILURE CALL SERVICE or FAN MOTOR 2 FAILURE
50018	57.2 FAN FAILURE CALL SERVICE or FAN MOTOR 3 FAILURE
50019	57.4 FAN FAILURE CALL SERVICE or FAN MOTOR 4 FAILURE
50020	UPPER INPUT TRAY LIFTER MALFUNCTION
50021	LOWER INPUT TRAY LIFTER MALFUNCTION
50022	58.3 PRINTER ERROR CYCLE POWER or MULTIPURPOSE TRAY LIFTER MALFUNCTION
50023	59.1 PRINTER ERROR CYCLE POWER or MAIN MOTOR STARTUP FAILURE
50024	59.2 PRINTER ERROR CYCLE POWER or MAIN MOTOR ROTATION FAILURE
50025	FINISHER MALFUNCTION [BIN NAME] or EXTERNAL BINDING DEVICE HAS A MALFUNCTION
50026	DEVICE ERROR X.YY CYCLE POWER or AN EXTERNAL DEVICE HAS REPORTED A MALFUNCTION
50027	DUPLEX ERROR CHECK DUPLEX UNIT or DUPLEX UNIT GUIDE FAILED AND REQUIRES SERVICE
50028	55.XX ERROR PRESS SELECT KEY or COMMUNICATION FAILURE BETWEEN FORMATTER AND ENGINE

Status Code	Display String or Code Meaning
50029	64 PRINTER ERROR CYCLE POWER or VIDEO DMA TRANSFER TIMED OUT
50030	FAN MOTOR 5 FAILURE
50031	FAN MOTOR 6 FAILURE
50032	FAN MOTOR 7 FAILURE
50033	FAN MOTOR 8 FAILURE
505xx	Firmware Error, Power Cycle
50599	Processor Error, Power Cycle

Glossary

⤾

This character indicates that the current command line is a continuation of the previous line. For example, “These ⤾words are all part of the same line.”

|

The vertical bar, when shown in a command, indicates that either one or the other options may be selected, but not both.

Active I/O Port

The I/O port which is providing the data for the current print job. For LaserJet printers with automatic I/O switching, if there is no current print job, then automatic I/O switching is enabled and all I/O ports are active.

Auto-Continue

If the auto-continue mode is configured to ON, the printer continues printing during certain non-fatal error conditions. If auto-continue is OFF and these same conditions occur, the printer goes off-line until the Continue or On Line key is pressed. Auto-continue mode can be configured using the printer's control panel or using PJL commands (refer to the user's manual for the specific PCL 5 printer).

Automatic I/O Switching

Automatic I/O switching allows data to be sent to any of the printer's I/O ports without reconfiguring the active I/O port from the control panel.

When the printer is turned on, all I/O ports are enabled to accept data. The first port to receive data is called the active I/O port. The active I/O port is the source for the current print job. All other I/O ports temporarily are disabled until the next job boundary.

After a job boundary is encountered and there is no data available from the active I/O port, all the I/O ports are enabled and checked for available data. The first port to receive data is the new active I/O port. The other ports are temporarily disabled, the print job processed, and then the automatic I/O switching process repeats.

Configuration

Configuration is the process of changing printer settings. The printer is configured using the control panel or PJL.

Context-Sensitive Printer Language Selection

Context-sensitive printer language selection is a method of selecting a printer language by looking at the first portion of a job to discover clues as to which printer language to use. The syntax differences in each printer language allow the language to be determined. Context-sensitive language selection is only operational if the control panel variable PERSONALITY is set to AUTO and the print job does not contain a PJL ENTER command before non-PJL data.

Control Code

A control code is a non-printable ASCII character that initiates a printer function, for example carriage return (<CR>), line feed (<LF>), and form feed (<FF>).

Default

A value used instead of a programmatically selected value. A factory default is a value programmed into the printer at the factory; this value is stored in read-only memory and cannot be changed by a user or operator. A user default is a default value, stored in non-volatile RAM (in printers that have NVRAM), that is selectable using the control panel or the PJL DEFAULT command.

Download

The process of transferring data, including soft fonts, macros, or raster data from a host computer to the printer.

Environment

See “Print Environment.”

Explicit Switching

Explicit switching occurs when a printer language is activated due to processing a PJL ENTER command.

Factory Default

Factory defaults refer to the feature settings that are programmed into the printer at the factory. These values are stored in read-only memory and cannot be changed. Factory default settings are in use unless you override them using either the control panel or by sending printer commands.

Factory Default Environment

A factory default is a setting programmed into the printer at the factory. The group of all the printer's factory settings is referred to as the Factory Default Environment.

Implicit Switching

Implicit switching occurs when a printer language is activated due to reception of non-PJL data which is not preceded by a PJL ENTER command. (See context-sensitive printer language selection.)

Job Boundary

The beginning or end of a print job. The position between two characters of data in the data stream where the previous character is the last character of the previous print job, and the next character is the first character of the next print job.

Macro

A macro is a collection of escape sequences, control codes, and data downloaded to the printer. Its execution can be initiated using a single command.

Modified Print Environment

Once a printer language, such as PCL, is entered, the current feature settings constitute the modified print environment. Whenever a feature setting is altered using printer language commands, the new setting is recorded in the Modified Print Environment.

Non-Printing Mode

Printing selected pages in a print job by sending the entire print job, the desired starting page number, and the ending page number. The PJL JOB command options START and END are used to provide the starting page number and the ending page number. When the printer processes the pages that are not printed, the printer is said to be in non-printing mode.

Non-Volatile Memory

Random Access Memory where contents are preserved when the printer is powered off (volatile RAM is memory where contents are not preserved when the device is powered off).

Offline/Online

Online is a condition during which the printer accepts data from the host computer. When the printer is online, the ON LINE light is lit. When offline, the printer cannot accept data from the host.

Personality

The printer firmware related to transforming a particular type of printer language data, like PCL or PostScript, into images that the printer's operating system can print. The printer uses different personalities (different firmware) to handle data from different printer languages. PCL and PostScript commands are each processed by separate firmware.

New personalities can be added to some LaserJet printers using means such as cartridges or ROM SIMMs. PJL is not a personality (you cannot print using PJL). See “Personality Switching.”

Personality Switching

The process of shutting down the current personality and activating the appropriate personality to process the next print job. For example, when the printer is processing PCL data, the PCL personality is activated; for PostScript data, the PostScript personality is activated.

PJL Current Environment

The PJL Current Environment is the set of features that is active when a PJL job is entered. As soon as a PJL job is entered, the PJL Current Environment settings are the same as the User Default Environment. Applications then can modify the PJL Current Environment values using the PJL SET command. The PJL Current Environment provides a base set of values when entering a printer language.

PJL Job

A PJL job is any print job containing PJL commands. Properly formed PJL jobs always begin and end with the UEL command.

PJL Reset Condition

A PJL reset condition prompts the printer to load the User Default values into the PJL Current Environment, which are then loaded into the Modified Print Environment. In this document, the term PJL reset condition refers to any of the following events: a power-on, UEL command (when not between a JOB/EOJ command pair), the @PJL INITIALIZE, @PJL RESET, @PJL JOB, or @PJL EOJ commands. Also included are other printer-specific events, such as control panel reset, a printer language-specific exit command (when not between a JOB/EOJ pair), such as ^D for PostScript, and data stream idle timeouts (see Appendix A for information about job boundaries and timeouts for the HP LaserJet 4 and 5 printer families).

Poorly Formed Print Job

A print job which either starts or ends with an invalid data stream sequence. For example, any job that does not begin *and* end with a UEL command is a poorly formed job. This manual describes how to create properly formed print jobs and contains many examples to demonstrate them. See Chapters 1 – 3 and Chapter 11 for more information about creating well-formed jobs.

Print Environment

The group of all the printer's current feature settings, collectively, is referred to as the print environment. The print environment is modified using printer commands and control panel settings.

Printer Language

A set of syntax and semantic rules used to control a printer. PCL and PostScript are both printer languages—they both contain commands that enable the user to control where marks are printed on a page.

Ready Message

A ready message is displayed on the control panel display when no error conditions are present. When errors occur, an error message replaces the ready message until the situation is corrected or the printer auto-continues. The PJL RDYMSG command is used to specify a ready message to replace the "00 READY" message.

Secure PJL Job

A "secure" PJL job is a job that contains the correct password in the JOB command. See the "PJL Job Security" section in Chapter 5 for more information.

Solicited Status

Solicited status is printer status information that is specifically requested. For example, the command @PJL INFO ID solicits the printer's ID. The printer responds to solicited status messages as they are received. See "unsolicited status."

Status Readback

Sending printer status information from the printer to the host computer.

Universal Exit Language (UEL) Command

A PJL command, understood by all LaserJet personalities, that prompts the active personality to finish processing the current job and exit the personality. PJL also recognizes the UEL command and, when received, PJL discards any unprocessed partial PJL command and prepares to accept the next PJL command.

Unsolicited Status

Unsolicited status (USTATUS) is printer status information sent as a result of certain printer events occurring, such as when the printer runs out of paper, a job finishes printing, or when a certain time period elapses. There are several types of unsolicited status (DEVICE, JOB, PAGE, and TIMED); unsolicited status must be enabled with the USTATUS command.

User Default

A user default is a default value that is selectable by way of the operator control panel or the PJL DEFAULT command.

User Default Environment

The User Default Environment consists of the user default settings selected from the control panel or by way of the PJL DEFAULT command. The user default settings are stored in non-volatile memory (in those printers that have NVRAM). Those settings not selected using the control panel or PJL DEFAULT command are set to the factory default values.

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